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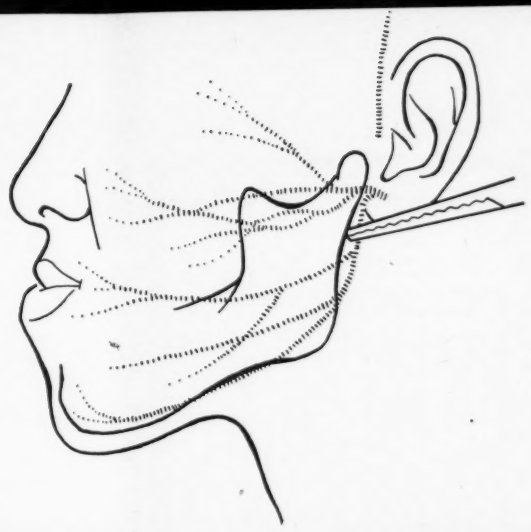

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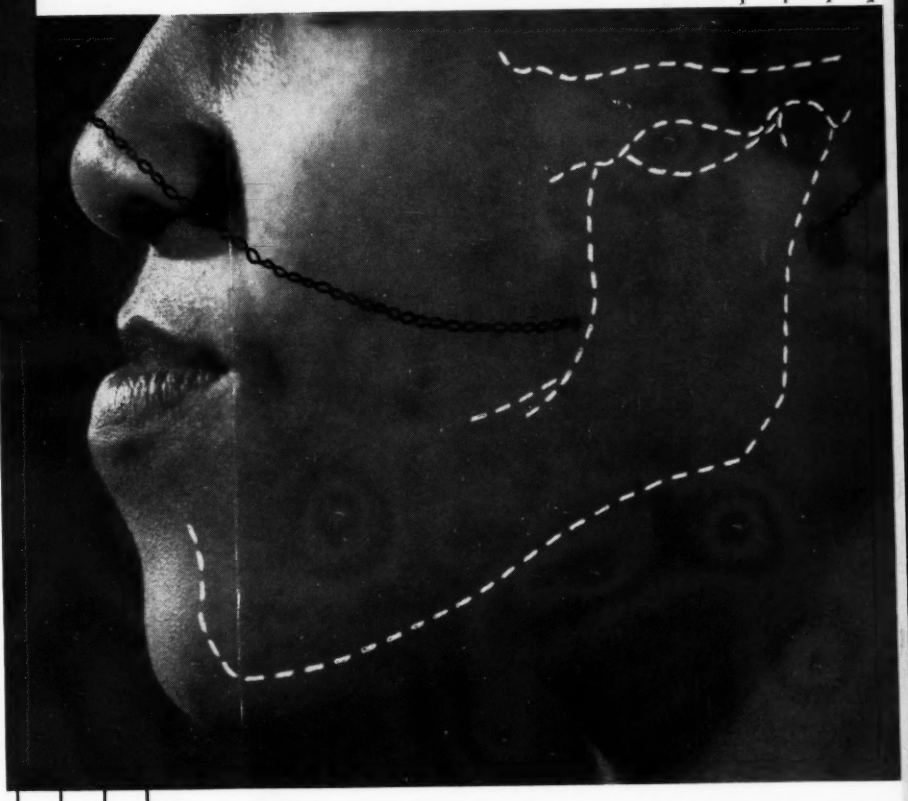

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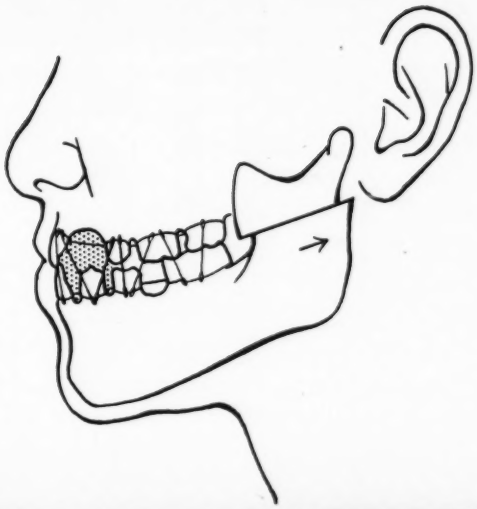

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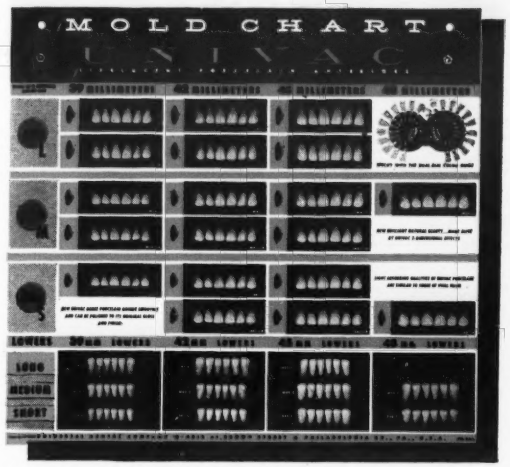

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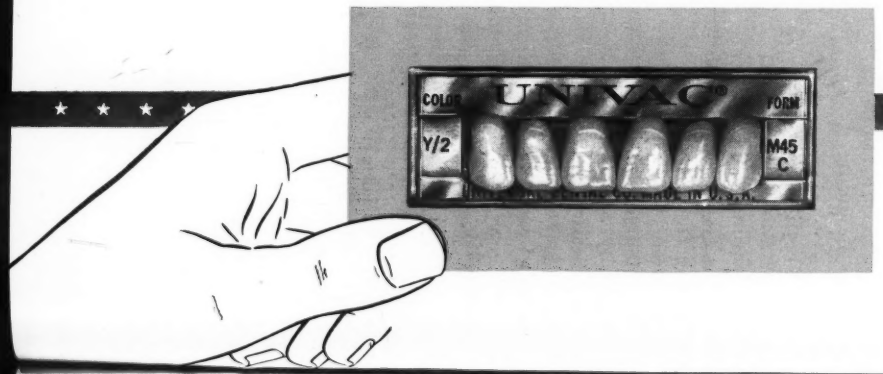

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About Our CONTRIBUTORS

Louis W. Schultz, B.S., D.D.S., M.D., (University of Illinois); Sunder J. Vazirani, D.D.S., (University of Bombay, 1942); and Michael H. Dyer, B.S., 1954, D.D.S. (University of Illinois College of Dentistry, 1956) co-authors of the article Surgical Treatment of Mandibular Prognathism: Osteotomy in the Ascending Ramus are members of the staff of the University of Illinois College of Medicine and Research Educational Hospitals.

Marion B. Hopkins, D.D.S. (Chicago College of Dental Surgery, 1929) is a general practitioner who has engaged in research in resin material for ten years. Doctor Hopkins' article is The Use of Acrylic Resin in Dental Restorations.

Fred A. Slack, Jr., D.D.S. (The Thomas W. Evans Dental Institute, University of Pennsylvania, 1932) has taught prosthetics at the University of Pennsylvania graduate school since 1950. Doctor Slack has published extensively on the subject of prosthetics and plastics. His article in the current issue is Experiments in Directional Polymerization.

Walter H. Griesinger, B.S. (Washington State College, 1924), D.M.D. (North Pacific Dental College, 1926) has taught chemistry and clinical orthodontics. Doctor Griesinger has devoted twenty-five years to the development of the nursing device that he describes in his article, Biologic Implications in the Nursing of the Infant.

EDWARD J. RYAN, B.S., D.D.S., Editor

WANDA T. PICKARD, B.A., Assistant Editor

708 Church Street, Evanston, Illinois

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Surgical Treatment of Mandibular Prognathism:

OSTEOTOMY *in the Ascending Ramus**

LOUIS W. SCHULTZ, M.D., D.D.S., SUNDER J. VAZIRANI, D.D.S., and MICHAEL H. DYER, B.S., D.D.S., Chicago

DIGEST

This article reports a case of mandibular prognathism successfully corrected. A step-by-step description is illustrated of the surgical technique employed in resection under local anesthesia and reposition of the mandible. The results of the procedure were excellent. Examination of the patient six months after surgery revealed normal function of mandibular movements and a notable improvement in general health.

General Factors Involved

Prognathism or mandibular protrusion is a condition described as excessive forward development of the mandible. The maxilla is usually unaffected.

Causes—These are innumerable. The important ones are (1) heredity, (2) congenital malformations, (3) endocrine disturbances, (4) trauma, (5) nutritional deficiencies, and (6) infectious diseases.

Clinical Features—(1) Marked obtuseness of the angle of the mandible is noted with frequent elongation of the body, (2) bilateral crossbite, (3) marked prominence of the chin, (4) protusion of the lower lip, (5) speech impairment, and (6) depression of the infraorbital facial features.

Symptoms—The prognathic patient usually seeks treatment for (1) improvement of speech, (2) masticatory function, (3) facial and esthetic reasons.

Corrective Method Employed—Various surgical and orthodontic approaches have been utilized in the correction of prognathism. Osteotomy of the ascending ramus is one of the surgical methods. This was first devised by Blair in 1898.[1] His technique proved satisfactory and has been used successfully by various surgeons.

Case History

A 28-year-old, Negro female, presented to the Oral Surgery Clinic of the Research and Educational Hospitals with a complaint of difficulty with mastication and a desire for improved appearance.

She had consulted various dentists and extractions of the maxillary teeth had been advised to be replaced with a prosthesis. The patient refused extraction of the teeth and did not wish to wear an artificial appliance.

General Examination—The patient was revealed to be a normal, healthy, slim female, who appeared in excellent health except for mandibular prognathism. Routine laboratory tests of blood, urine, serology, and bone survey were essentially normal. The admission body weight was 108 pounds. She stated she had not gained any weight during the last ten years.

Regional Examination of Face and Oral Cavity—The following conditions were noted: (1) Obvious mandibular prognathism with protrusion of lower lip and depression of the infraorbital facial features (Figs. 1 and 2). (2) Intraoral examination showed an anterior open bite. Occlusal contacts were present between only the upper and lower first molars (Fig. 3). The tongue was slightly larger than normal. (4) A few teeth had been lost due to caries. The remaining teeth, gingiva, and soft tissues were essentially normal.

Evaluating Measures

(1) Study models were constructed to permit evaluation of the occlusion. (2) Extraoral, anteroposterior, lateral, and intraoral radiographs were taken and preoperative photographs were made. (3) After surveying the dental models, occlusal equilibration was performed to obtain maximum normal occlusion. (4) The air passages and all sources of infection were evaluated and corrected. The patient was informed of the possible surgical complication.

Hospital Course and Surgical Technique

The patient was admitted to the hospital nine days after her initial visit. Simple arch bars were placed in the dental arches of maxilla and mandible, and adapted to the teeth utilizing every tooth possible (Fig. 3). On the following day, the patient was premedicated with ¼ grain of morphine, taken to the operating room, and was prepared and draped in the usual manner. Bilateral intraoral mandibular nerve blocks were made using 1½ per cent Primacaine.®

Procedure—1. The posterior border of the ramus of the mandible of the left side was palpated approximately one-half centimeter below the lobe of the ear.

2. The parotoid gland was pushed aside, and under local infiltration anesthesia a small skin incision, 5 millimeters long was made, and with blunt dissection the posterior border of the ramus was identified (Fig. 4).

*From the Department of Surgery, Division of Oral Surgery, University of Illinois College of Medicine and Research & Educational Hospitals.

[1]Pearson, W. H., Resection of the Mandible, Am. J. Orthodont. & Oral Surg. **29**:141, (March) 1943.

1. *and* **2.** ***Preoperative photographs showing depression of the infraorbital facial features and protrusion of the lower lip.***

3. A curved aneurysm needle was passed behind the ramus and advanced along the lingual surface of the ramus, hugging the bone closely, and was brought out in the cheek after passing the anterior margin. In order to avoid the facial nerve, maxillary, and inferior dental vessels, the manipulation of the instrument was done by the sense of touch alone.

4. A second incision was made in front of the anterior border of the ramus (Fig. 5).

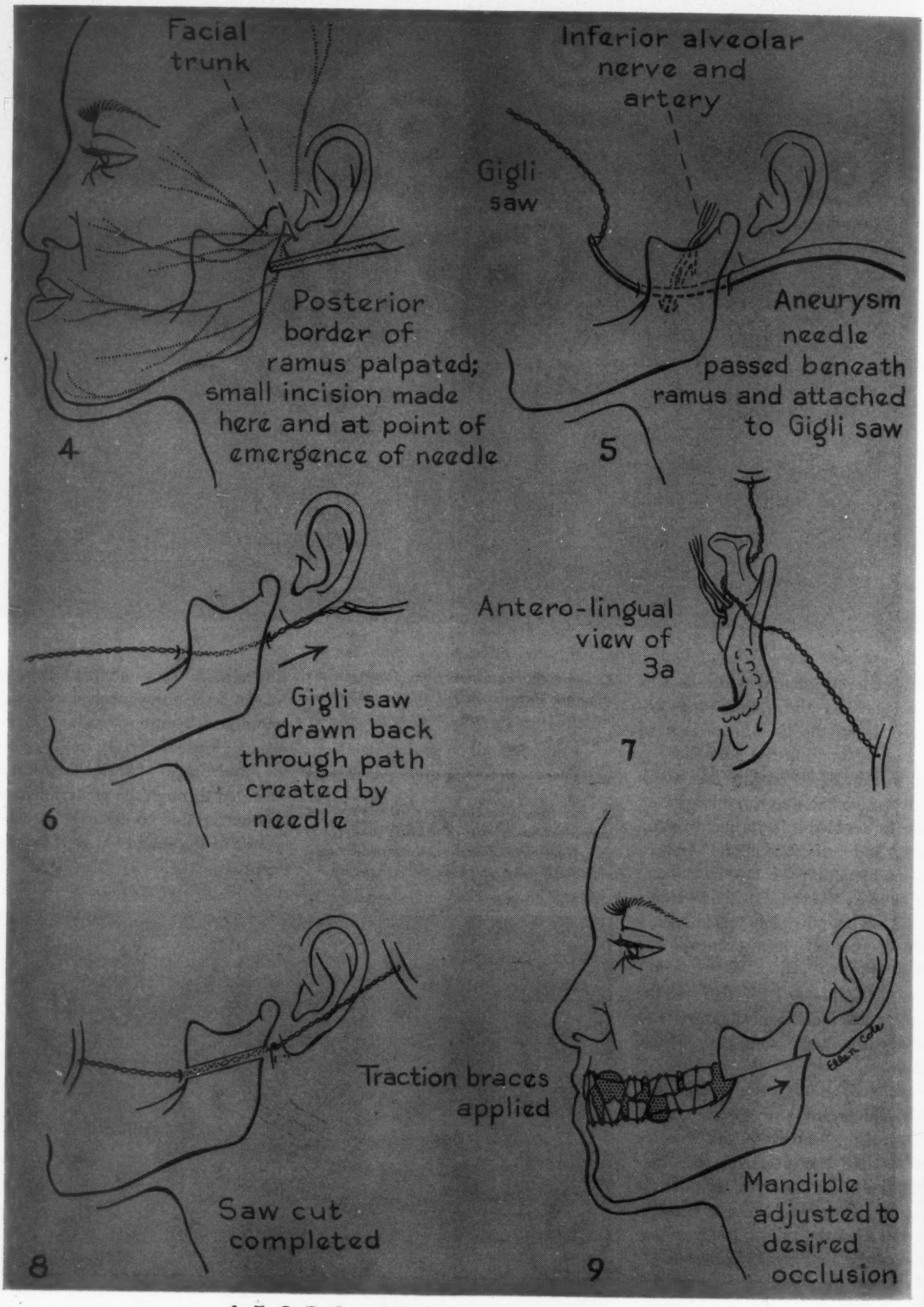
5. A Gigli saw was tied to the needle with black silk ligature and passed through the same path. (Figs. 6 and 7).

6. The bone was cut through obliquely downward and forward, one-half centimeter lower on the anterior border than the posterior, the saw being held as straight as possible (Fig. 8). Care was taken to protect the soft tissues and skin. After sectioning, the saw was withdrawn.

7. The same procedure was followed on the right side, leaving the mandible freely movable. At this time, the patient's mouth was opened and the mandible and maxilla were placed in predetermined occlusion and immobilized by intermaxillary wire fixation (Figs. 9 and 10).

Final Stage—(1) A hemostat was inserted through the posterior margin of the incision to ensure that the cut edges of the mandible were correctly approximated. (2) The skin edges

3. ***Preoperative roentgen film showing lateral view of the mandible and maxilla. Note arch bars in the maxilla and mandible placed prior to operation.***


Facial trunk
Posterior border of ramus palpated; small incision made here and at point of emergence of needle
4
Inferior alveolar nerve and artery
Gigli saw
Aneurysm needle passed beneath ramus and attached to Gigli saw
5
Gigli saw drawn back through path created by needle
6
Antero-lingual view of 3a
7
Traction braces applied
Saw cut completed
8
Mandible adjusted to desired occlusion
9

4, 5, 6, 7, 8, and **9.** ***Steps in the operative procedure.***

were closed with 5-0 Nylon suture. (3) A pressure dressing was applied on both sides and maintained with an Ace bandage.

Postoperative Measures— (A) Demerol,® 50 milligrams was given every four hours for pain; (B) high protein diet was maintained; liquid on the first day changed to a soft diet as tolerated; (C) Co-Pryronil® antihistamine capsule, 50 milligrams every eight hours, for four days was an aid in reducing postoperative pain and swelling.

Dressing Removed: The pressure dressing was removed on the fourth postoperative day. There were slight, bilateral swellings in the parotid area and considerable pain on the left side.

Condition Favorable: There was no evidence of parotid salivary fistula, damage of the facial nerve branches, or unusual hematoma. The patient had complete sensation in the mandibular nerve.

The patient was discharged five days after admission and was observed in the out-patient clinic.

10. ***Roentgenogram taken after operation.***

Postoperative Observation

The immediate postoperative x-ray views revealed good alinement of fragments and normal healing. The following steps were taken: (1) After eight weeks of immobilization, the intermaxilliary fixation was removed and the mandible allowed to function. (2) Intermaxillary elastics were placed in the posterior region for an additional two weeks to assist the mandible to return to the occlusion established by the surgery. (3) Occlusal equilibration was repeated periodically until the patient was comfortable.

Facial Appearance Improved—Ex-

11. ***and*** **12.** ***Postoperative photographs taken six months after operation reveal improved facial appearance. Note minimal amount of postoperative scar formation.***

amination after six months revealed improved appearance (Figs. 11 and 12) with normal function of mandibular movements. A firm callus was demonstrated by clinical and x-ray examination.

General Health Satisfactory — The patient gained ten pounds of weight and has been well satisfied with the result of treatment.

Comments

Since the condyle is the important growth center of the mandible, it is generally agreed that prognathism should not be corrected surgically until growth has been completed.

Among the complications that may occur in this procedure are: (1) injury to the parotid gland and facial nerve, (2) severe hematomata from regional blood vessels, and (3) subsequently an open bite may develop.

These complications can be avoided by careful presurgical evaluation of the case and a thorough understanding of the surgical anatomy. It is felt that this operation is both simple and practical. It should be given consideration in the surgical management of mandibular prognathism.

Summary

The etiology, clinical features, surgical technique, and the complications of mandibular prognathism have been described.

In a case of prognathism, resection under local anesthesia was accomplished and the mandible was repositioned.

840 *South Wood Street*

Obvious Cancer

Importance of Prompt Diagnosis

In discussions of the prevention and control of cancer, or of education of the public to awareness of cancer, another aspect of the problem should be considered. What could a physician do about the persons he sees (not as patients) who have obvious tumors or conditions that are believed to predispose to neoplastic disease? By what means can he best urge the person to seek medical attention while the disease is in an early stage?

Types of Visible Tumors

Among visible tumors, lesions of the skin of the head, neck, and hands are the more immediately apparent. Actually, all skin tumors should be considered precancerous or cancer until proved otherwise. The type of skin cancer that occurs most frequently on the hands is *squamous cell carcinoma,* which usually has the characteristics of an ulcer. *Pigmented nevi* are among the more common visible tumors. Although they occur on all parts of the body, they are most often seen on the face, neck, and back. Many physicians believe that nevi that are subjected to irritation should be widely excised, as malignant change is possible, and complete eradication is essential.

Senile Keratoses—The importance of keratoses and other precursors of cancer is seldom recognized by laymen. *"Farmer's skin," or senile keratosis,* is not, despite its name, confined to elderly persons. These lesions are usually seen on skin areas that are exposed to sunlight. The development of redness or discoloration in keratotic sites is frequently a warning signal of incipient cancer. It is necessary to differentiate senile keratoses from the senile verrucae which rarely become malignant.

Cutaneous Horns—These may represent massive keratoses or may develop from such lesions as warts, scars, or sebaceous cysts. Such growths are obvious because of their unusual shape. As a large percentage become squamous cell cancers they also should be excised for prophylaxis. Many such tumors are not recognized as precancerous by the affected person, and the physician's function is, therefore, doubly important.

Naevus Flammeus — Popularly known as the port wine stain. This lesion, as well as other types of *hemangioma,* is both common and conspicuous. Although neither commonly is malignant or becomes malignant, burns or ulcerations may result if treatment is improper or inadequate, and the burns or ulcerations, may, in turn be carcinogenic.

Osteogenic Sarcomas and Chondromas—These, as well as other bone tumors, may be visible in areas such as the joints or the epiphyseal junctions of the long bones. Many tumors of this sort are apparent long before the person consults a physician for diagnosis or therapy. Of course these lesions are not specifically identifiable without exploration, but the resultant swelling or limitation of motion is obvious. Signs of abnormal function discerned by the layman would be indicative of possible tumors to a physician.

Problem of Responsibility

The physician who, on his way to the office or in a public place, sees persons with obvious tumors has a problem. It is that of responsibility, shared by everyone who attempts education of the laity concerning cancer. What ethical procedure can be used to encourage such persons to procure medical aid while there is still hope of help and of cure?

Adapted from *Cancer Bulletin* 9:33 (March-April) 1957.

The Use of ACRYLIC RESIN *in Dental Restorations*

MARION B. HOPKINS, D.D.S., Chicago

DIGEST

This technique for a direct immediate acrylic jacket crown is the result of ten years of experience and produces excellent jacket crowns that are stable in color and durability. Step-by-step directions are given for completing the technique.

Technique for Jacket Crowns

It is desirable to have on hand a good stock of manufactured acrylic anterior denture teeth. These teeth become the jackets. The following steps are taken:

1. The preparation is the same as for a porcelain jacket crown. Be sure of a definite shoulder, at least 1 millimeter wide. Never allow the acrylic to become less than 1 millimeter, as strength and color will be impaired.

2. Select an acrylic denture tooth of the correct size, shape, and color or as nearly correct as possible (they may be altered to some extent). Hollow it out (Fig. 1). Start with a large No. 10 round bur and finish with a No. 4 or No. 5. Be careful not to make the acrylic thinner than 1 millimeter. If the denture tooth is not large enough labiolingually, cut out the entire lingual area (Fig. 2).

3. The next step is to contour the tooth. The gingival of the acrylic tooth must be cut down until the tooth is the proper length. Also have it fit the labial shoulder as closely as possible (Fig. 3).

4. The cut-out area is moistened with monomer and quickly filled with a rather thick mix of fast setting acrylic of the proper shade (Fig. 4). It is pressed into position in the mouth, being particular of the alinement and that the labiogingival edge is tight against the shoulder (Fig. 5). With a moistened finger, the material on the lingual may be patted into place. Do not try to contour at this time. Place the material firmly in position and hold it with gentle pressure. With an exploror in the other hand, start testing the consistency of the acrylic. As the material gains the resilient rubbery stage, remove the tooth quickly in the manner of removing an alginate impression (Fig. 6).

5. The acrylic in the tooth is now allowed to set. Holding it close to a lighted electric bulb will hasten the setting time (approximately 3 minutes with the aid of heat). As soon as it is hard enough, it can be ground down and the lingual can be shaped, if that surface is being rebuilt (Fig. 7). Now try it back in the mouth. If for any reason it does not seat properly, it may be ground slightly on the inside until it can be seated on the preparation in proper alinement. A new mix of acrylic is added (sparingly this time) and the process repeated. These corrections may be repeated over and over until the fit is perfected.

6. The jacket is now polished and cemented in place with resin cement (Fig. 8).

Technique for Inlays

The brush technique, the strip technique, and the methods and suggestions of various manufacturers have all been failures in the author's experience. Color stability is poor and porosity not only interferes with color and strength but increases dimensional changes. With the following inlay technique, however, reasonably good results have been obtained:

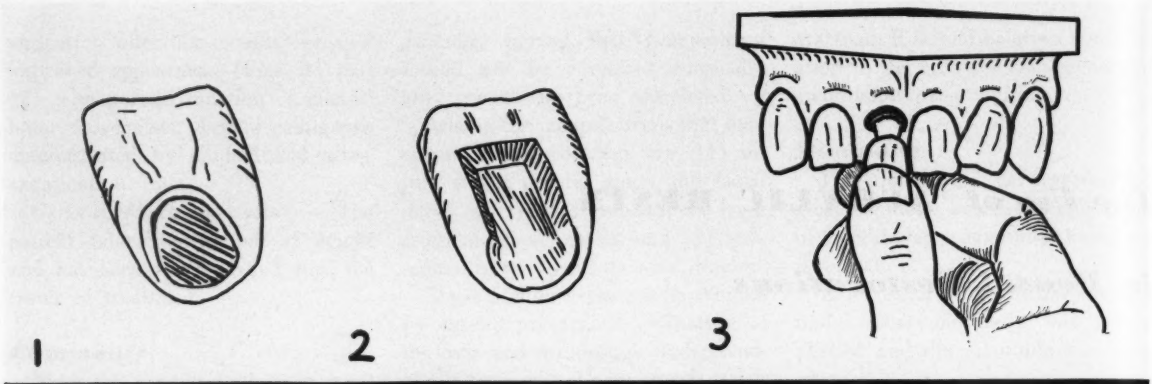
1. The preparation is the same as for a gold inlay except that the margins are not beveled and there should be no narrow isthmus in dovetailing. A good bulk of material is necessary for strength.

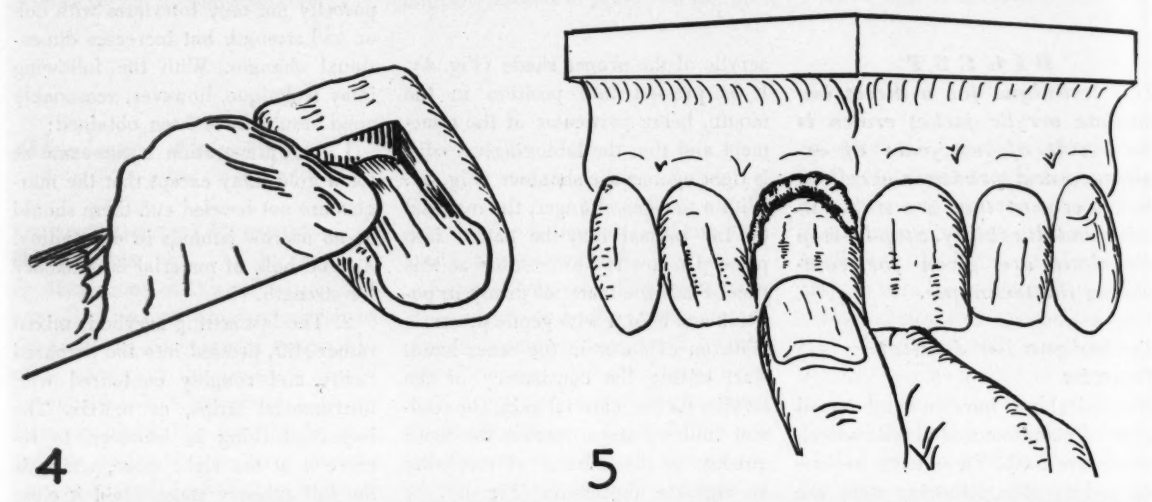
2. The fast setting acrylic is mixed rather stiff, pressed into the prepared cavity and roughly contoured with instruments, strips, or matrix. The important thing is, however, to remove it at the right stage, which is the full rubbery stage. Hold it close to a lighted electric bulb and it will set in about 3 minutes. It is then ground down and contoured with stones and discs.

3. Try it in the preparation. If it does not go into place properly, undercuts in the preparation are at fault or there is distortion in the withdrawal. The preparation should be checked and any faults corrected. Trim the cavity side of the inlay generously so that it can easily be reseated.

4. Remove the inlay, dry, and moisten the cavity surface with monomer. A new mix of acrylic is applied sparingly and the inlay reseated. At the rubbery stage it is removed and after setting, it is again trimmed and smoothed. A properly fitting inlay should be the result. If the fit is not excellent, however, it may be corrected repeatedly.

5. Dry the field completely and cement the inlay with resin cement. In about 5 minutes it may receive the final polish.





1. ***Hollow out the denture tooth.***

2. ***Cut out the lingual of the tooth.***

3. ***Contour for length and gingival fit.***

4. ***Fill with fast setting acrylic.***

5. ***The acrylic material is pressed into place.***

6. ***The acrylic is removed when it is at the rubbery stage.***

Restoration of Angles—Angles may be restored on anterior teeth with this method and will be satisfactory, except for color stability. This can be improved, however, by grinding off the face of the restoration 1 millimeter and replacing it with a new mix.

Color Stability Improved — Not only will this method improve color stability but because of less porosity, a better polish will result. The theory is that small mixes produce less chemical activity, less chemical activity produces less heat; and less heat produces smaller bubbles and smaller amounts of decomposition products which cause discoloration.

Steele's Type Facing Repairs

It is quite simple to make a repair of a Steele's type facing from an acrylic denture tooth, by using the same principles as for the jacket crowns:

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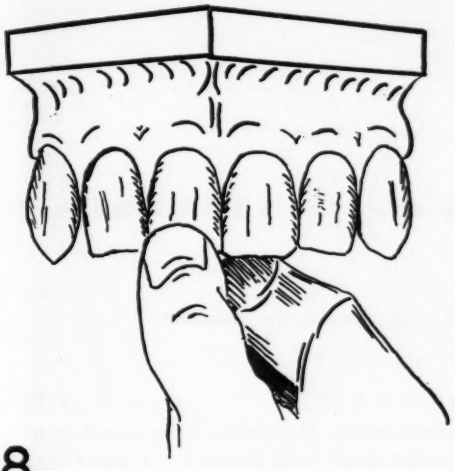

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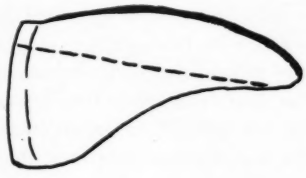

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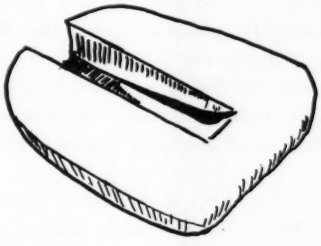

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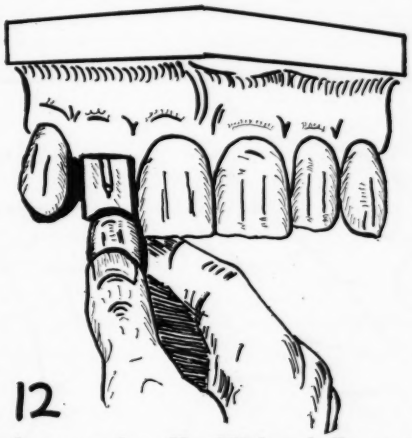

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7. ***The tooth is ground down and the lingual is shaped.***

8. ***Polished and cemented with resin cement.***

9. and **10.** ***Flatten the lingual with a No. 9 bur. Make a groove 1/8 inch wide with a No. 10 bur.***

11. ***Clear out the groove with a No. 558 bur.***

12. ***Replace on backing to make sure of proper fit.***

1. Select an acrylic denture tooth of the correct size and shade.

2. With a large 1/8-inch side stone, cut off and flatten the lingual area (Fig. 9).

3. Cut a 1/8-inch (the width of the stone) groove from the gingival toward the incisal (Fig. 10). Place against backing and contour.

4. A stiff mix of acrylic is pressed into the groove and the facing is pressed into proper place on the backing.

5. Remove quickly at the rubbery stage.

6. Polish the area that comes in contact with the tissue and with a No. 558 bur, hollow out the groove. Replace on backing to make certain of proper fit (Figs. 11 and 12).

7. Cement in place with resin cement.

1903 *East 79th Street*

Ending the CONTINUOUS SUTURE*

J. A. CARR, F.R.C.S., Manchester, England

DIGEST

The continuous suture line must be ended by a knot, and the knot usually chosen is a reef knot in which one strand is tied against two. In fine material with a good "bite," such as thread, this knot may fulfill all requirements. When it is used on thickish catgut, however, it produces a bulky knot, the three short ends obtrude, and it has a tendency to work loose so that a third throw is often added, further increasing the bulk of the knot without adding much to its security.

A fixed bowline would appear to be a better knot to use, but difficulty arises in tying it under tension at the end of a suture line. This difficulty has been overcome, and the purpose of this article is to present the method used. In general terms the knot is completely formed in a loose state and then tightened in stages. The resulting knot is compact, firm, and has only one short end.

Description of Method

The illustrations show the following steps:

(1) A suture line is sewed from left to right by a right-handed operator.

(2) A loop at the end of the cord is taken in the needle holder, and the main loop is displayed over the fingers of the left hand.

(3) The point of the needle holder is made to follow the course of the arrow.

(4) As a result the cord becomes wound around the needle holder.

(5) Care is taken that the end of the cord passed *under* the main loop, and the grip of the left thumb and finger is changed to near the end of the cord.

(6) The grip of the needle holder is then transferred to the end of the cord, after passing *over* the main loop.

(7) All the slack is now taken up between the loop around the needle holder and that around the left index.

(8) The end of the cord is now withdrawn through the loop which was around the needle holder, and all the slack taken up in the loop around the left index. It is important that, in the last two manipulations, the loops should be drawn really tight.

(9) Finally, the knot is completed by pulling on the end still held in the needle holder.

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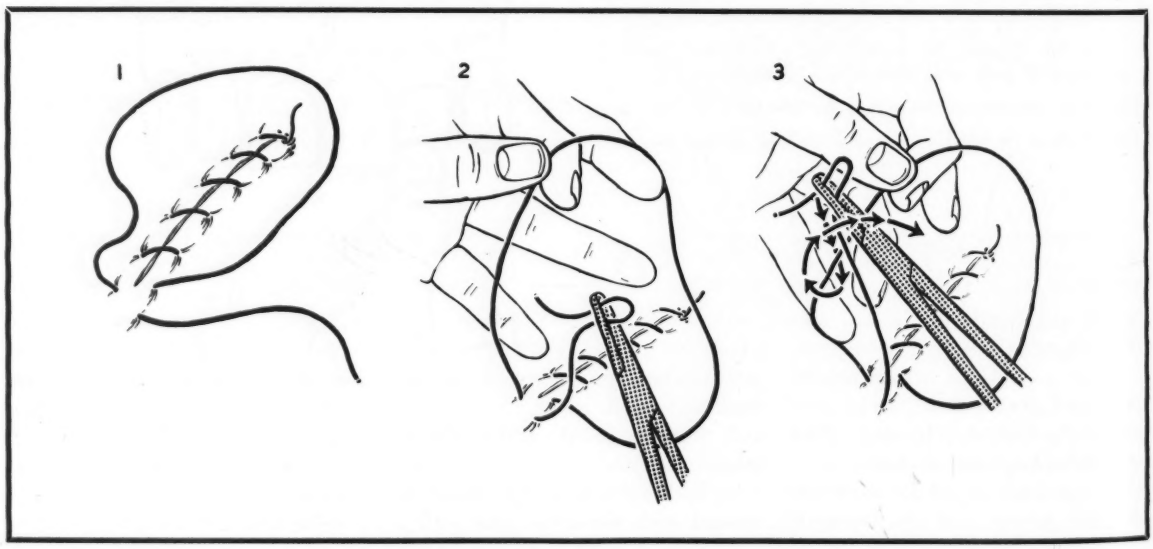
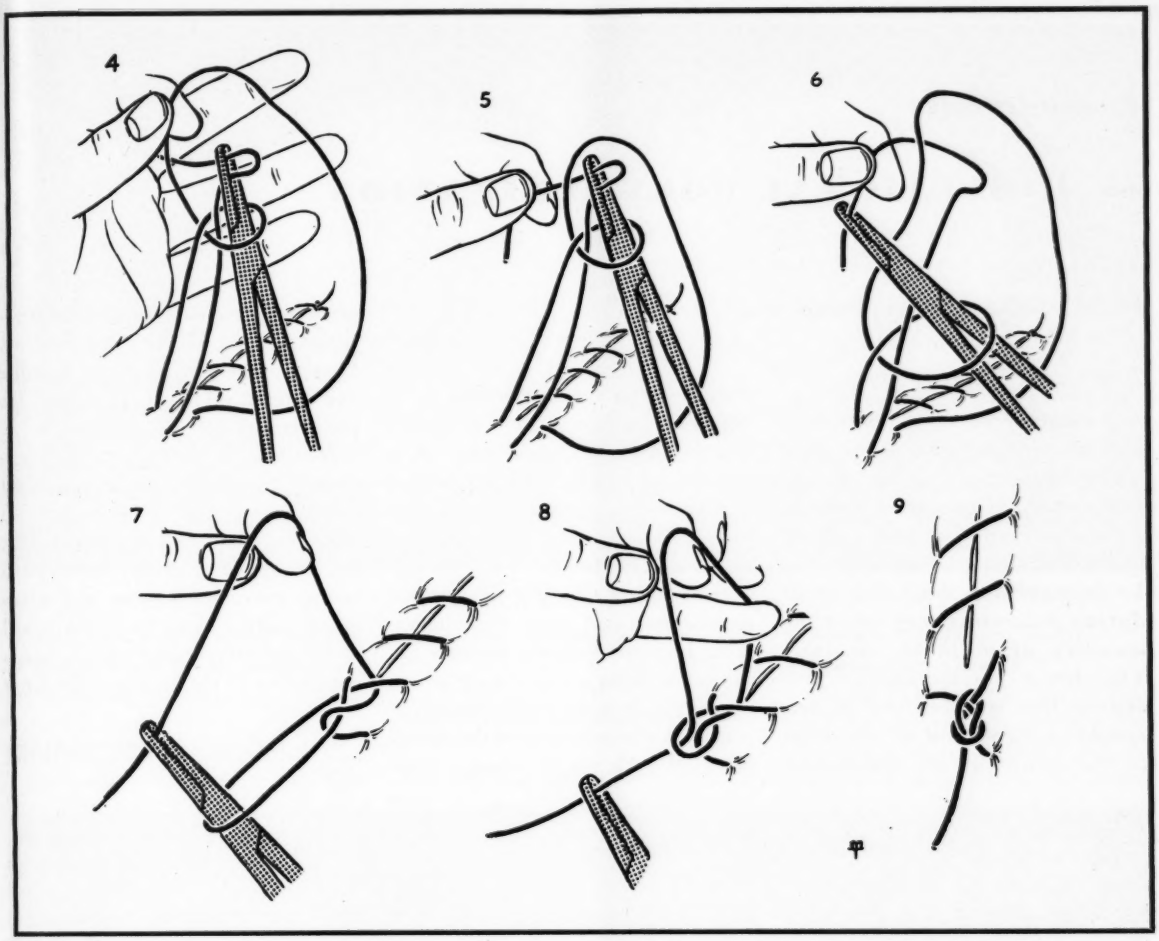
*From the Manchester Royal Infirmary, Manchester, England.





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Oral Moniliasis

ORAL moniliasis, or thrush, is rapidly and completely relieved by administration of 100,000 units of nystatin (Mycostatin) in oral suspension four times daily. The lesions usually disappear within three days, affirm Virginis S. Stovall, M. D., of the Robert B. Green Memorial Hospital, San Antonio, Texas and associates. Drinking the undiluted suspension gives better results than topical application of Mycostatin solution or ingestion of the antibiotic mixed with food.

From *Modern Medicine* **24**:115 (Oct.) 1956.

Experiments in DIRECTIONAL POLYMERIZATION

FRED A. SLACK, JR., D.D.S., Philadelphia

DIGEST

Experiments in direct polymerization techniques were first undertaken because of the dimensional changes that occur in all plastic dentures. Although dimensional changes may appear to be unimportant, those that occur during processing may affect the accuracy of fit in the denture. The direct polymerization procedure that was evolved is described in detail and all the steps in the technique are illustrated.

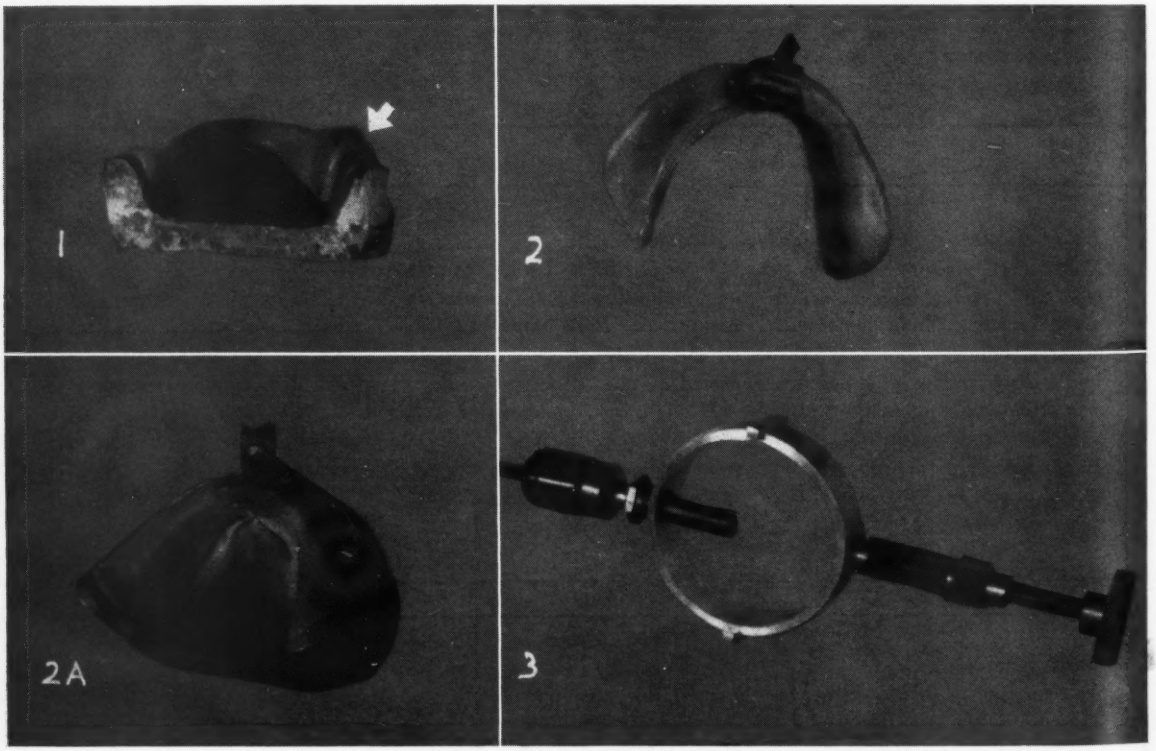
Description of Process

Directional polymerization[1] is a process in which the hardening of a denture occurs through the direction of heat toward one portion and then toward the other and until polymerization is complete.

Dimensional Changes—The experiments described here were undertaken because all plastic dentures are subject to dimensional change which may occur from the coefficient of expansion and contraction of the material itself such as the change from processing temperature to room temperature to mouth temperature. Changes also occur from moisture and drying, from aging, from the pressures of use and abuse.

Detrimental Changes — These changes seem not to be important beyond the ability of the material to stand or the tissues to accomodate. But changes that occur during processing are more serious and cause actual pulling away from the model at the posterior palate region, and a contraction of the flanges of the lower

[1]Slack, Fred A., Jr.: Experiments in Directional Polymerization, DENTAL DIGEST **54**-68-69 (Feb.) 1948.

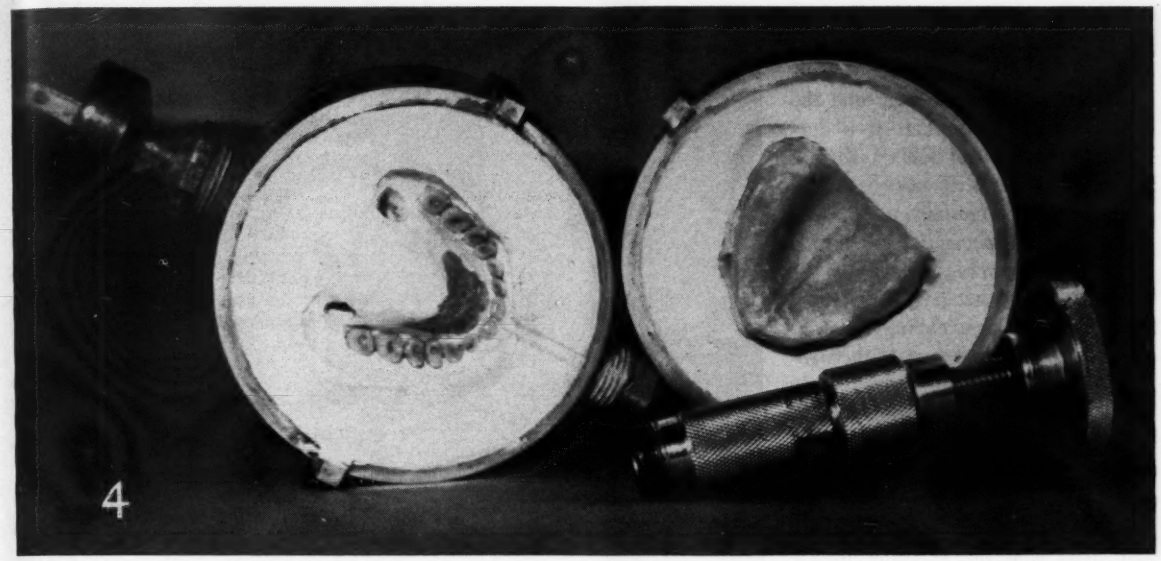


1. *Extreme pulling away from the model after conventional flask curing.*

2. *Dark sprue portion of denture is additional material inserted during processing cycle.*

2A. *Same base shown on metal model. Fit is as perfect as eye can detect.*

3. *Section of flask showing heater in one end, injector in opposite end.*



4. ***Complete assembly after wax boil-out.***

denture. Figure 1 illustrates this type of change which is extremely serious in well-fitting dentures.

Method of Processing

All dentures are now processed by wet or dry heat. The heat is directed to the outside of the flask, or to some other part of the flask. In this way the entire denture is processed at the same time.

Contraction Unavoidable — An over-all contraction of the denture is unavoidable because of the contractual properties of the plastic material during the change from the soft to the hard state. Even though efforts are made to inject additional material into the flask during processing, the results are substantially the same, as the entire denture and injected material are hardening at the same time.

Progressive Hardening Achieved— By directing the heat inside the flask, and to one part of the denture only, a progressive hardening takes place which eventually reaches all parts of the denture, even the sprue which feeds extra material into the mold at the unheated end.

Explanation of Theory—1. Visualize a glass vessel filled to the top with liquid. This liquid gels and then hardens upon the application of heat. It also shrinks as it hardens.

2. Immerse the entire vessel in an oven and heat from all sides at once. The resultant hardened liquid is smaller than the inside of the vessel.

3. Repeat the experiment, but this time direct the heat at the bottom only, and as shrinkage occurs introduce additional material at the top. This time the result is a solid that is the exact shape of the inside of the vessel.

4. By imagining the liquid to be denture material and the vessel to be the mold inside the flask, the analogy is complete.

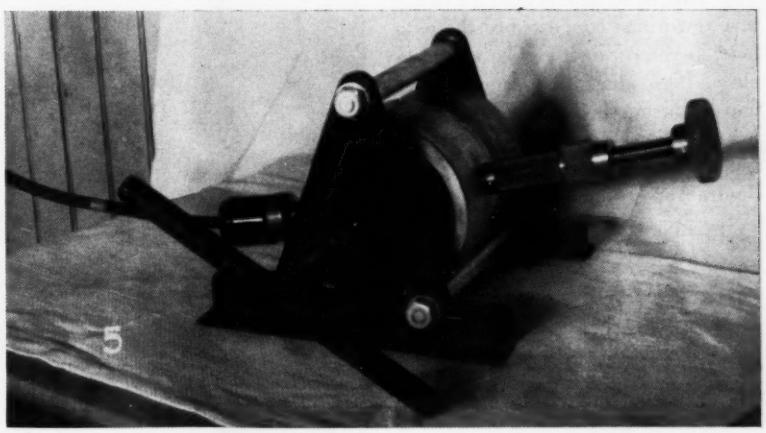
Process in Directional Polymerization

Figure 2, A and B, shows a base made by directional polymerization. The dark area is additional injected material. It accurately fits the model. Figure 3 shows the open flask with the heater in one end and the injector in the opposite end.

Cycles in Ordinary Processing— Denture processing ordinarily consists of two cycles:

(A) The cycle of applied heat during which the polymer and monomer are still plastic. Preliminary bonds are being formed between the molecules and a gradual stiffening is taking place.

(B) As more and more bonds form



5. ***Case has been test packed and is now in rack for processing.***

they begin to generate heat which is over and above the applied heat. This is the beginning of the second cycle. More and more bonds form and the material begins to harden. It is during this second cycle that the shrinkage occurs.

Cycles Occur Simultaneously in Directional Polymerization—As the denture is becoming heated at the heater end only that part of the denture becomes warm during the first few minutes. As that part of the denture becomes hot, the second cycle begins with its accompanying shrinkage. But that part of the denture at the injector end is only warm and is still soft and in the first cycle.

Shrinkage Absorbed: At the same time more material is being forced in at the injector to take up the shrinkage as it is occurring. In like manner this further portion of the denture passes into the second cycle and hardens but still more material is flowing in to prevent shrinkage, from the cooler injector end.

Full Mold Completed: The cycles continue to completion and a full mold results, devoid of all shrinkage.

Additional Steps in Processing

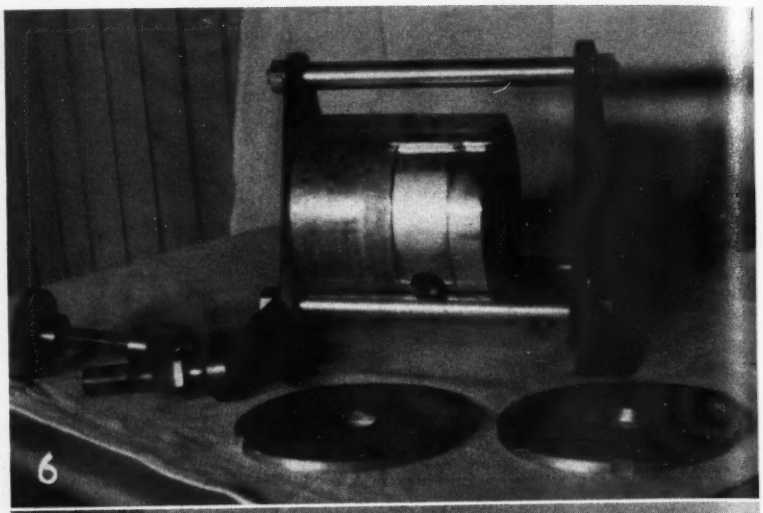
1. The heater is unscrewed during processing so that it does not come in contact with the metal of the flask. Figure 4 shows the two halves invested routinely in the two halves of the flask.

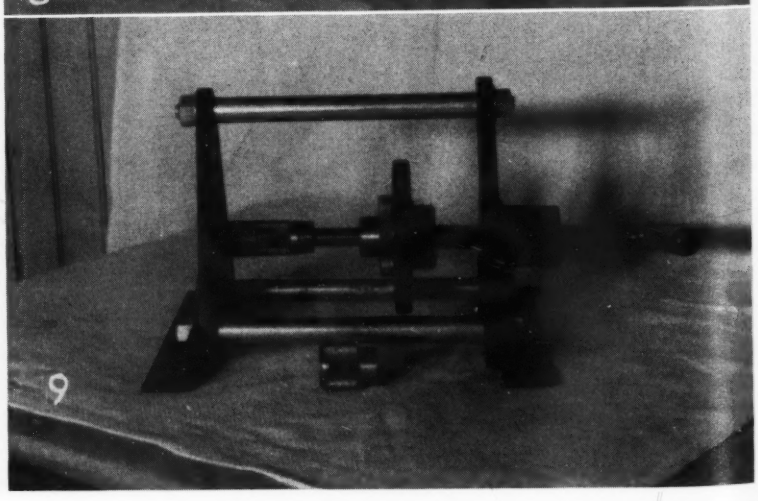
2. A plug is used in the injector end to facilitate handling.

3. A sprue or gate is notched in the investment and connected to the plug hole, as shown, or it can be waxed in place. Both plug and heater are removed during boil-out of wax.

4. Test packing is accomplished as usual with plug and heater in place. Figure 5 shows a case being processed in the press.

5. Processing takes one half hour.





6. ***Ejection is simple and positive.***

7. ***Exploded view of flask.***

8. ***Exploded view of stainless steel injector.***

9. ***Hardened sprue is ejected from injector.***

Injectors have been filled with material left after test packing, and have replaced the plug in the flask.

6. All flash was removed before placing flasks in the press to eliminate open bite.

7. The heater is attached to a 110-volt line and the injector is tightened by hand. The injector can produce 600 pounds per square inch. It is tightened frequently during the first ten minutes of the cycle.

8. The heater is only contacting investment, and the flask on the injector side is barely warm at the end of the cycle.

9. The sprue is entirely hard at the end of the cycle which proves the case is completely polymerized.

Investment Removed in One Piece —Figure 6 shows the case being deflasked into the ejection ring. Heater, injector, and lids of the flask have been removed. The sprue breaks off automatically during precision ejection. The investment comes out in one piece and is cooled in water or air before removing the denture. The two halves of the investment do not separate during ejection. Figure 7 shows the exploded view of the flask. Figure 8 shows the exploded view of the injector. Figure 9 shows the injector with center sections removed, ejecting the plunger from the nozzle.

Cleaning the Injector Unnecessary —The complete injector is stainless steel and never needs cleaning.

Conclusion

The equipment described was made in 1950 and the author has made all his dentures by this method since that time. Seven units have been constructed for other operators and satisfactory dentures have been made by all of them. The method is clean, precise, positive, produces no heat or steam, and is ideally suited to the office dental laboratory. Additional units are available direct from the manufacturer if desired. By no other means has the author been able to produce dentures of comparable fit and accuracy.

835 *North 19th Street*

Human Nutrition and Individual Variability

ROGER J. WILLIAMS, Ph.D. Austin, Texas

Extensive Study Made Of Calcium Requirements

An early observation relating to variation in human calcium needs was made by one authority who cites two normal 5-year-old children who, in the same environment and eating the same food, retained 264 and 469 milligrams of calcium, respectively, per day for 45 days. A more recent study dealing specifically with variation indicates that the variance cited above underestimates that which occurs among human male adults. Balance studies were performed on 19 healthy males, each receiving initially 229 milligrams of calcium daily. On this regimen one person was in calcium balance while another was losing calcium at the rate of 256 milligrams per day. The requirements for calcium balance in the 19 persons in experiments of at least 20 days duration, varied from 222 milligrams to 1018 milligrams. On the basis of the calcium requirements per kilogram of body weight the range was 3.52 to 16.16 milligrams. On either basis the range is nearly 5-fold.

Extreme Variation Observed— On the basis of this and many other studies the Food and Nutrition Board of the National Research Council state with respect to calcium that "wide variations among persons prevail, suggesting metabolic differences not explained by intake or absorption." It seems safe to conclude that if a large population (both male and female) were studied the range in calcium needs would be found substantially larger than 5-fold.

Adaption to Lower Levels— It is well recognized that in Oriental countries millions of people never get calcium at levels such as are regarded adequate in America. It is commonly supposed that the Oriental people have become adapted to a lower calcium intake. The mechanism involved in this supposed adaption is unknown, and it is not known to what extent this relatively low calcium intake may modify growth rates or ultimate stature.

Possible Genetic Selection—If persons who have a high calcium requirement are placed in an environment where they cannot get the desirable amount, they will either exist in a deficient and unhealthy state or will be eliminated from the population. It seems probable that in Oriental countries where food calcium is scarce, there has been genetic selection, and that through the centuries those with high calcium demands have been eliminated from the population. It seems likely, in the absence of evidence to the contrary, that different ethnic groups have genetically different requirements for calcium and that the Oriental adaptation is at least partly genetic.

Variance in Calcium Needs in Animals— In animal experiments designed particularly to study the question of variability in individual needs, the results indicated that even individual experimental mice from an inbred colony have substantial variance in their calcium needs. The same is true of rats and there is evidence that substantial variance in calcium needs exists among cattle. For example, some cattle in a herd suffer from calcium deficiency when they are placed on wheat pasturage, while others show no symptoms of "wheat disease." Critical nutritional experiments on calcium needs involving animals having as heterogeneous an ancestry as human beings are unknown to the writer.

Adapted from *Borden's Review of Nutritional Research* **17**:12 (March-April) 1956.

Biologic Implications in the NURSING *of the* INFANT

W. H. GRIESINGER, D.M.D., Portland, Oregon

DIGEST

Surveys by Salzmann[1] and McCall[2] show that approximately 51 per cent of preschool and school children have malformation of the teeth and jaws. The consensus is that over 80 per cent of these abnormalities, and the resultant malocclusion, can be prevented. This is a challenge to preventive dentistry.

During nursing physical laws are often violated. Thus with every suckle the baby makes there are forces involved which may contribute to dental deformities.

These facts are the foundation for the artificial nursing technique described in this article that more fully complies with functional muscle balance of the structures involved by utilizing properly the most rapid growth period in the life of the infant.

Anatomic and Physiologic Considerations

It is generally recognized that stable and well balanced teeth and dental arches are developed primarily through harmonious action of the muscles of mastication, of the face, and mouth, together with the forces exerted by the tongue and atmospheric pressure. Development thus occurs in three dimensions.

Atmospheric and Negative Pressure—In the process of swallowing, tongue and circumoral muscles produce a negative pressure (vacuum) in the mouth. Contraction of these muscles and downward movement of the mandible in swallowing prevent the air from rushing into the mouth and destroying the vacuum. During normal breast feeding the infant's lips are closed, atmospheric pressure assisting in creating a lip-seal. There is then little or no air swallowing.

Reason for Coordinated Function—These coordinated functions are possible because the atmospheric pressure (15 pounds per square inch) is greater than the negative pressure within the oral cavity, thus supporting those particular fibers of the lips that may be unduly weak.

Requirements of an Artificial Nursing Technique

An adequate technique must (1) bring into harmony the fundamental physical laws with anatomic structures and physiologic processes to ensure the same kind of muscular action that occurs when the infant is given the human breast; (2) convey food (milk) to the infant without necessarily permitting the baby to swallow air, and (3) allow air or pent-up gases in the stomach to escape into the bottle.

Muscular Action May be Duplicated—Comparison of breast feeding with artificial feeding shows that the muscular action in breast feeding may be duplicated in artificial feeding and emulated by proper nursing techniques. The number of feedings per day (usually six) lasting approximately two hours each day, may be utilized in developing a balanced musculature and a more normal dental arch.

Results of Strain from Muscular Imbalance—In order to comply with physical laws, artificial or bottle feeding disrupts the horizontal balance between the infant's head and body. Consequently undue strain is put on the circumoral muscles, the amount of strain may then increase the distal position of the jaw or retard its forward growth and development, as shown by the prevalence of distal or Class II cases of malocclusion.

Modification Necessary to Relieve Strain—A mechanical advantage is, therefore, necessary to relieve the strain and direct the functional growth and development for muscular balance and harmony.

Nursing Position

At birth the jaw is in a distal position. When the infant nursed at the breast is properly held in conformity with the laws of gravitation the distal position of the jaw is brought forward and normal shaping of the dental arch and ridge generally ensues.

Breast Feeding is Positional Nursing—Whether it takes the right or left breast, the infant extracts the milk primarily by means of the mandible and strong muscles of mastication, massaging the breast, in addition to using a powerful tongue action. Under normal conditions the sucking reflexes are so synchronized that no milk is lost. The upper dental arch together with the lip and its supporting structures play a minor role in nursing, that of holding the breast steady and forming a "lip-seal." Consequently these tissues are not subjected to the same stress and strain as the lower jaw.

Lip Seal Formed—The mother's breast forms a mass of uniform tex-

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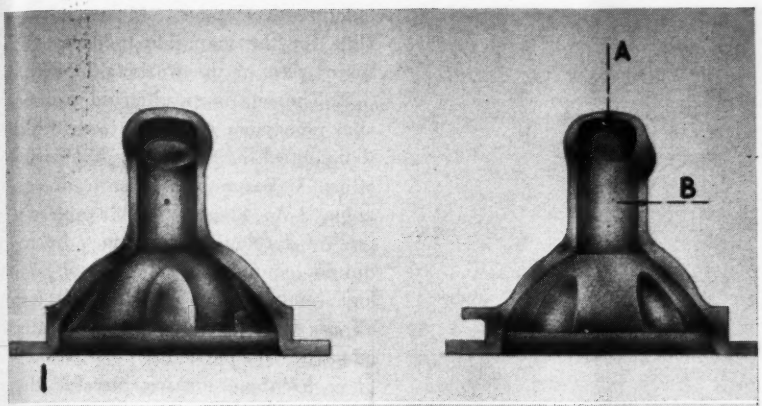
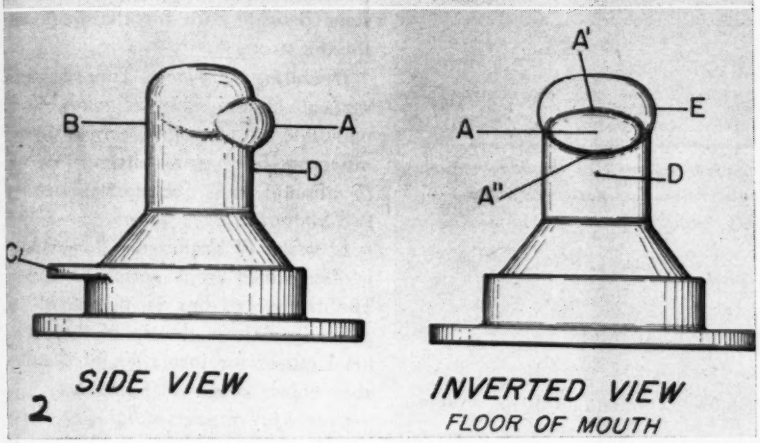
[1]Salzman, J. A.: Principles of Orthodontia, Ed. 2, Philadelphia, J. B. Lippincott Company, 1950, p. 3.

[2]McCall, John Oppie: A Study of Malocclusion in Preschool and School Children. D. Items Int.: 66-131-133 (Feb.) 1944.





1. ***Cross section of nipple, showing the variable thickness in terms of shading in lateral wall. Internal view of curved roll or transverse bar. Cross section of the transverse bar. Base shows vertical cone for strengthening base without too much rigidity. (A) Feeding hole. (B) Vent.***

2. ***(A) Transverse Bar-longitudinal radius. (B) Oblate Tip (slightly flattened surface) rubber thinned for broader surface contact. (C) Tab indicates position of nurser. (D) Vent. Air or gases swallowed are allowed to escape into negative pressure area in bottle. A' Upper radius of transverse bar. A" Lower radius of transverse bar for development control. (E) Lateral surface of nurser tip. Increased rubber shading.***

ture which completely engages the anterior portion of the oral cavity, providing broad surface contact for the tongue action. There is no point contact at any time. There exists muscle balance aided by atmospheric pressure in forming a lip seal which aids in expansion and development of a normal dental arch during the most rapid growth period.

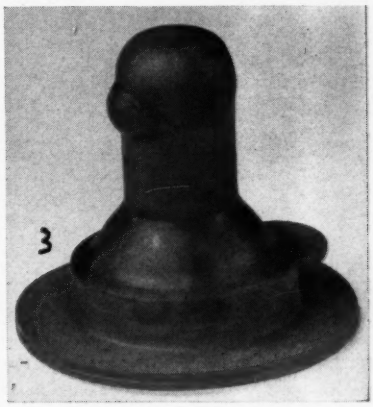
Breast Feeding Emulated by Oblate Nurser—The mass formed by the artificial nipple has a completely different texture. The technique of the oblate nurser and its rubber shading requires no point contact but allows for the broad surface contact in the upper arch; in the lower jaw the surface contact is further enhanced by the transverse bar, as the alveolar process and basal bone and musculature *carry the functional working load* involved in nursing, emulating breast feeding. Thus a balanced muscle action with development in three dimensions is provided.

Impairment of Normal Action Eliminated—The narrow surface of centralized working field of contact in the median plane which engaged only a limited portion of the oral cavity and frequently impinged, impeded, or impaired a normal action, growth and development of the dental arch, tongue, nasal septum and sinuses is eliminated.

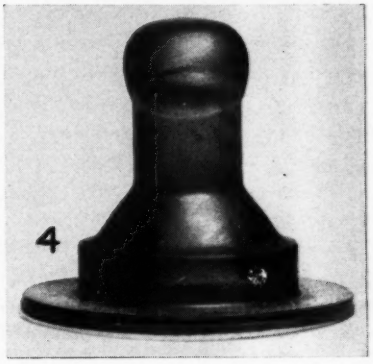
Factors Involved in Nursing Function

The following are three of Newton's laws whch are relevant:

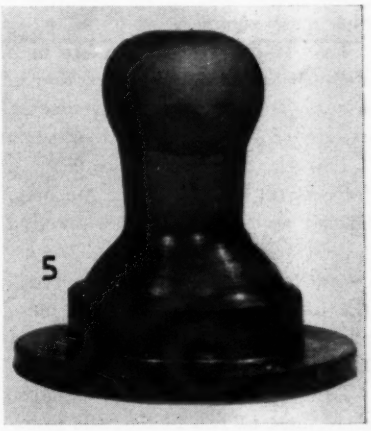
Law 1—(Extraoral anchorage). The breast or artificial nurser.



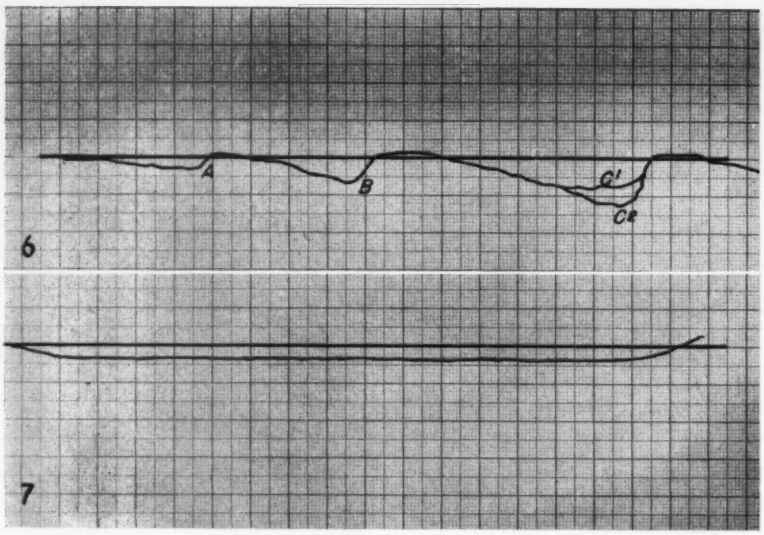
3. ***Side view of nurser.***



4. ***Lingual or floor-of-mouth view.***



5. ***View shows nurser after three months of use. Note expanded bolus type. Controlled by transverse bar.***



6. ***Intraoral venting. Graph shows the negative pressure in the bottle during the nursing of the infant, making possible the release of gases from the baby's stomach during feeding, and in the extremely young circumvents the air, directing it into the bottle.***

Graph shows negative pressure with low peak.

Feeding 8:30 P.M. Maximum relief load (C 1).

Supporting column of mercury approximately two inches.

Feeding 8:30 A.M. Maximum relief load (Fig. 6, c2).

Time: (A) One and one-half minutes. (A-B) Two and one-half minutes. (B-C) Three and one-half minutes.

Quantity: Four ounces.

Approximate pressure: .489 pounds per square inch per inch column of mercury.

Laws: Pascal's and Boyle's.

7. ***Extraoral venting. Graph shows the line during nursing. Illustrates how air is let into bottle during feeding with extraoral venting, air being continually present and subject to being swallowed.***

Laws II and III—Muscular action plus mass volume.

Law I: Every body persists in a state of rest, or of uniform motion in a straight line unless compelled by external force to change that state.

Law II: Whenever an unbalanced force is acting on a body, the body has an acceleration in the direction in which the force acts, and the acceleration is proportional to the force. An unbalanced force means more push and pull in one direction than in the other.

Law III: For every force in nature there must be two bodies, one to exert force and one to receive it. For every action or force there is an equal and opposite reaction.

Necessary Component Parts of an Artificial Nurser

(A) The oblate tip (slightly flattened top surface) has the following characteristics:

1. Broadened surface contact.
2. Rubber is thinned (lightened) in median plane.
3. Resistance is removed to allow for easy action.
4. Lateral walls are shaded heavier for the development of bolus (Fig. 1).

(B) The transverse bar has the following uses:

1. Serves as a mechanical advantage for the mandible, establishing the infant's bite, and controls musculature development. Makes it possible for the mandible to carry the major part of the working load.

2. The bar is an ellipsoid protrusion possessing externally four radii that control the developing functional bolus. Increasing the length of the angle A'A" makes possible any degree of development that may be required, compatible with the physiologic and genetic pattern. This bar affords a nurser technique specifically adapted to the particular *muscle tonus* of each infant, making possible the same delicate care for the weak as for the strong.

Operating Surface—The lingual surface of the alveolar bone and mandible is massaged through the numerous feedings of fifteen to twenty minutes each, or approximately two hours per day.

Location of Transverse Bar—This is determined by a series of tests. The transverse bar is placed at a point distal from the tip of the artificial nurser for formation of a suitable bolus.

Uses of Transverse Bar—1. Permits development of the mandible and associated structures.

2. It establishes and controls normal bite.

3. Prevents distal displacement of mandible.

4. Eliminates or reduces overbite and overclosure.

5. Permits development in three dimensions.

6. Makes it easier to treat prognathic cases.

7. Prevents and simplifies the treatment of cross-bites.

8. Completes a more perfect dentition for the baby from eighteen to twenty-four months (Figs. 3, 4, and 5).

Venting

Extraoral Venting—It is common knowledge that extraoral venting allows for air intake, and its effect is also known. The vent is generally placed in the base of the nipple.

Intraoral Venting—This is based upon the presence of an operational negative pressure balance within the bottle while nursing. The vent is

placed on the lingual side of the nurser, always in the floor of the mouth, the free-way permitting the air or gases to escape into the negative pressure space in the bottle during nursing. The air or gas bubbles may be seen to escape periodically into the negative pressure area in the bottle. As a result the infant does not swallow a significant amount of air[4,5],(Figs 6, 7, and 8).

Control of Colic—Colic, a manifestation of pain, may be controlled to a large degree or classified as to origin.

Results

Study indicates that the following conditions were improved:

1. Placement of the transverse bar at a specific point in the artificial nipple may well be the key to the solution of many Class II cases. The distal displacement of the mandible with the excess overbite and deep overclosure was corrected or prevented (Fig. 9a).

2. In a study of forty cases, ages four weeks to six months, in all cases an improved relationship of jaws was observed. Increased width, expansion of dental arch was obtained, and more so when the technique employed increased dimensions of radius A'A'' as shown in Figures 9b and 10.

3. Prognathism in the infant was readily controlled and the bite corrected if acquired. When hereditary characteristics were involved the response was good, but the improvement was more gradual (Figs. 11a and b, 12, 13a and b, and 14).

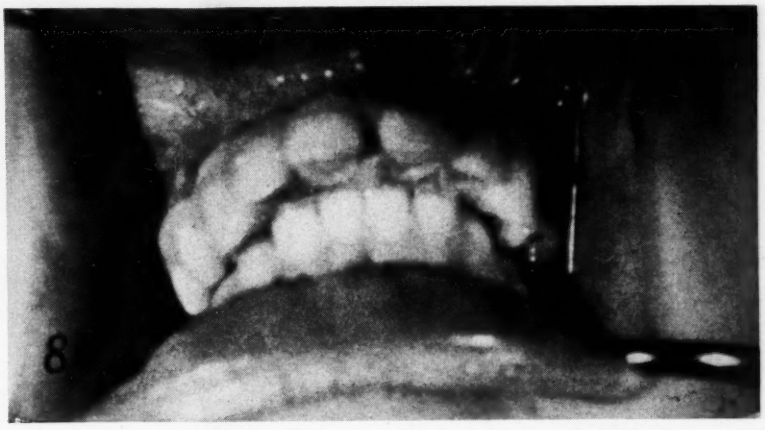
4. Colic due to gas or air pressure was readily relieved with almost instantaneous improvement. The exception was in the case of the spastic or weak muscle fiber as seen in twitching of lips.

5. Allergy cases responded well.

6. In a series of competitive tests infants favored the special technique and refused service from other types of nursers.

(*Continued on next page*)

[3]Spinney, Louis Bevier: A Textbook of Physics, Revised Edition, New York, The Macmillan Company, 1921, p. 41.
[4]Ibid.: p. 129.
[5]Ibid.: p. 139.



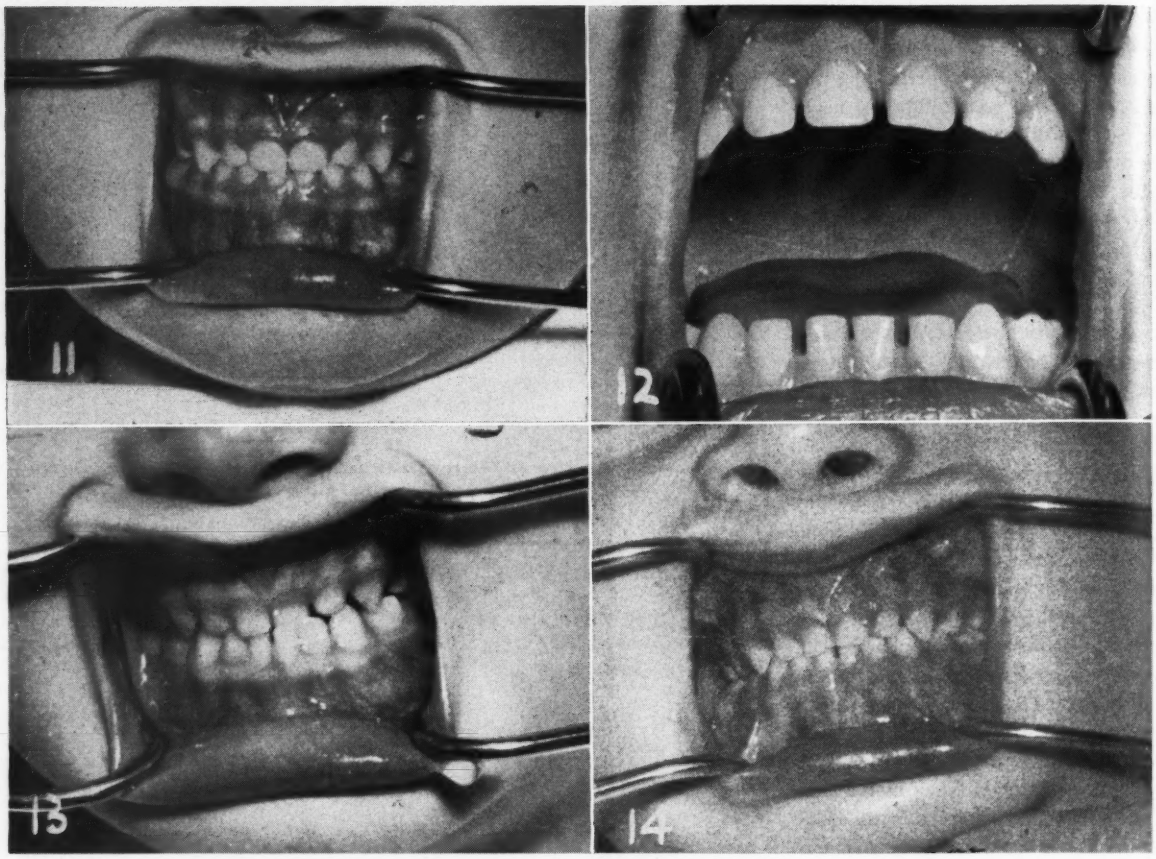
8. ***Photo showing deep overclosure. Breast fed nine months. A typical illustration which may result from faulty nursing technique or position.***

9. ***Six and one-half months old infant, having used nipple with transverse bar from infancy, shows an excellent arch and gives evidence of having established "bite."***

Parents: Father, normal dental arch with some crowding of teeth.

Mother: narrow upper dental arch with protruding teeth. Lower arch in distal relation.

10. ***Shows mandible in protrusion. Bottle used at age of two years and three months to assist in opening bite. Bottle used for five months. A lingual appliance was necessary in upper arch for one month to complete case.***



11. ***Completed case is shown. Advisability of early treatment when malposition is observed is demonstrated.***

12. ***Boy, four years old, used nipple eighteen months. Development of dental arches (mouth open) is shown.***

13. ***Child, age two years, four months. Notice cross-bite.***

14. ***Shows cross-bite corrected in three weeks.***

15. ***Artist's sketch illustrating method used in treatment of cases with protruding mandible, prognathism, and cross-bite. Shows child with bottle placed in the most effective manner. Archimedes' principle of leverage is applied. Nurser used with transverse bar up. All liquids, milk, fruit juices, and water are given baby with bottle. The bottle may be taken to bed if desired. Results are always good.***

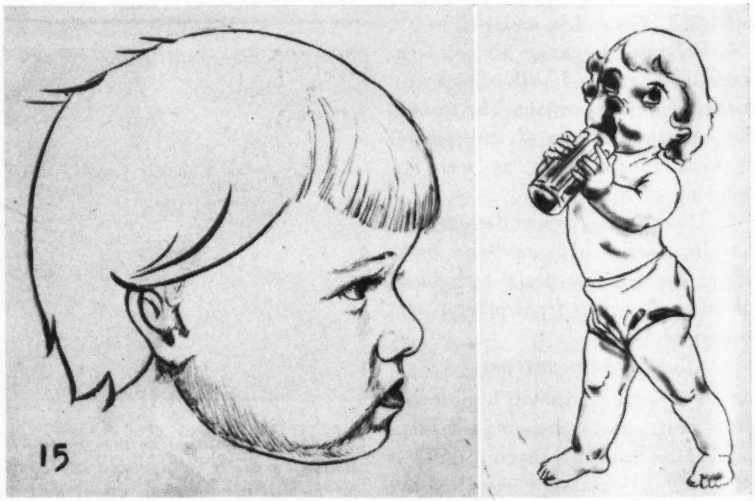
Summary

Surveys made among preschool and school children show that approximately 51 per cent of the children had malocclusion of the teeth and jaws, most of which could have been prevented.

Balanced dentition and dental arches are recognized as being developed through harmonious action of the muscles of mastication, the face, and mouth, along with the tongue and atmospheric pressure.

Adequate nursing technique must (1) ensure the same kind of muscle action as that in breast feeding and (2) convey milk to the infant without permitting the baby to swallow air. Such action may be duplicated by proper nursing technique in artificial feeding.

At birth the jaw is in a distal position, the lower jaw being subject to more strain and stress than the upper jaw. It is essential that babies be held, while nursing, in conformity with the laws of gravitation



to assure normal shaping of the dental arches and ridges.

Breast feeding is positional nursing. It provides a broad surface contact for tongue action, and thus aids in expansion and development of a normal dental arch during the most rapid period of growth.

The mass formed by the artificial nurser allows for a broad surface contact in the upper arch. In the lower jaw the surface contact is enhanced by the transverse bar, providing a balanced muscle action with development in three dimensions.

Newton's Laws are involved in nursing. Necessary component parts of the artificial nurser are:

1. Oblate tip, with broadened surface contact for bolus development.
2. Transverse bar, to control musculature development and establish infant's bite.
3. Vent placed on the lingual side of the nurser, in the floor of the mouth, to permit air to escape into the negative pressure space in the bottle and thus relieve colic.

Conclusions

Clinical tests have proved that: (1) colic, when due to air swallowed, is definitely relieved; (2) a more normal bite is established by means of developing the musculature of mouth and jaw and expanded arch; (3) balanced (physical) forces complement and support the biologic phase and growth pattern; (4) greater rest and comfort is provided the infant, producing a healthier and happier baby.

Weatherly Building

Infections that Complicate Oral Cancer

WHEN THE resistance of oral tissue is lowered, as in instances of oral cancer, organisms may invade the tissue and produce secondary infections. Trauma may facilitate development of infection, as does moisture and warmth.

Measures to Reduce Mouth Infection— Several effective procedures may be used to reduce mouth infection. The mouth should be kept as clean as possible by proper oral hygiene. This requires cleansing of the teeth and mucous membranes with cotton applicators, soft tooth brushes, hydrogen peroxide, warm normal saline solution, and irrigations.

Local Care of Wounds— Activated medicinal zinc peroxide is the best oxygenic product yet devised for local care of wounds in the oral cavity. Penicillin has been the agent of choice over a number of years. Other antibiotics are employed when patients are known to have an allergy to penicillin, when oral therapy is desirable, and when the infection is known to be more amenable to another drug.

Supplementary Treatment— When sulfonamides are used, they should be administered systemically, not locally. Antibiotics should be used as supplementary treatment and not as a substitute for such proper surgical treatment as incision and drainage of abcesses.

Adapted from *The Cancer Bulletin* **8**:108 (Nov.-Dec.) 1956.

Use of Antibiotics After Oral Surgery

FRANK HOLMES COOLEY, M.S., D.D.S., and SOL HABERMAN, Ph.D., Dallas

Summary

When blood cultures are made on patients immediately following oral surgery, a high incidence of bacteremia can be demonstrated. When these patients are given adequate doses of antibiotics, such as Terramycin,® the incidence of demonstrable bacteria in the blood stream is markedly reduced. This reduction is more evident in the group having no clinical signs of infected teeth or surrounding tissues.

Incidence Decreased by Preoperative Administration—Positive blood cultures were higher when a greater number of teeth was removed at one time. This incidence of bacteremia was markedly reduced in the premedicated patients by the administration of oral Terramycin 3 hours postoperatively.

Streptococcus Viridans Isolated — The organism most commonly found was *Streptococcus viridans.* In all cases the strains of *Streptococcus viridans* isolated showed an *in vitro* sensitivity to the antibiotic used in this report.

Adapted from *Journal of Dental Research* **36**:303 (April) 1957.

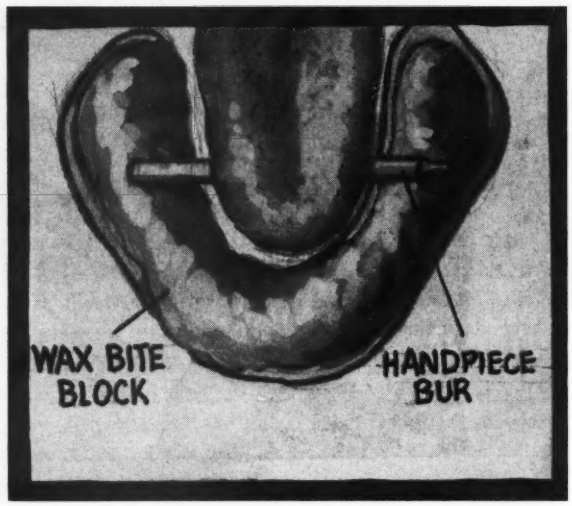
1

Clinical and Laborator

Repair of Steele's Facing on a Fixed Bridge

Victor Kassel, D.D.S., Port Jervis, New York

1. To replace a broken anterior Steele's facing on a fixed bridge, take a colloid impression and make a model. To prevent breakage of the thin incisal edge of the model, reinforce the lingual portion with plaster or stone before sending the model to the supply house for the selection of the facing.

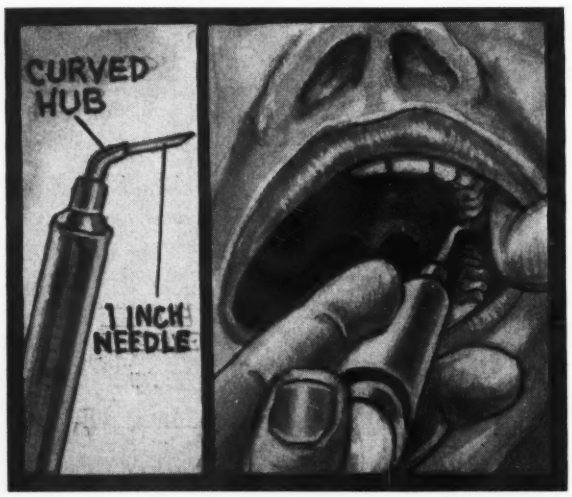


2

Stabilizing Lower Bite Block

Jack D. Morgenstern, D.D.S.

2. Heat a straight handpiece bur and place it across the lower bite block so that the tongue can hold the wax block in position when the bite is registered.



3

Tuberosity Injection Without Hematoma

W. J. Simpson, D.D.S., Niagara Falls, Canada

3. A one-inch needle in a curved hub is used to deposit the anesthetic solution behind the maxillary tuberosity. With this short, curved injection instrument it is virtually impossible to inject deep enough or lateral enough to penetrate the venous plexus.

READERS *are Urged to Collect $10.00*

For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay $10.00 on publication.

You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

Covering for Surgical Sponge

O. D. Donaldson, D.D.S., Portsmouth, Ohio

4. Coating the surface of an exodontia sponge with petroleum jelly will prevent undue absorption of blood by the gauze and will help to obtain a more satisfactory clot.

4

Base for Pouring and Scoring Models

C. R. Herrick, D.D.S., Hobart, Indiana

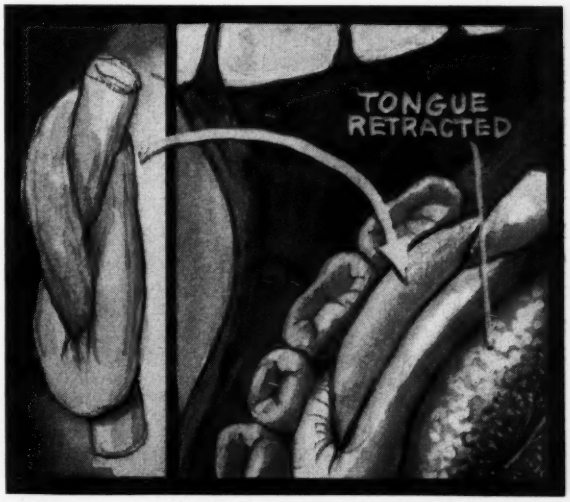
5. Pour a flat piece of plaster one-half inch thick and grind a V-shaped groove in the form of a cross. Pour latex rubber one-quarter inch thick over this plaster model. Separate. This latex form produces a base that will be properly scored for easy replacement of the model on the articulator.

5

Nonslip Tongue Retractor

Captain K. Hayashi, USAF (DC), Foster AFB, Texas

6. Tie a full length of a No. 2 cotton roll into a loose knot. Compress lengthwise and use as a tongue retractor during operative procedure on the lower teeth.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 380 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

The EDITOR'S *Page*

AMALGAM is the most widely used material for the restoration of carious teeth. When the principles of operative dentistry are followed carefully and the material is manipulated according to specifications, amalgam is an excellent restorative agent.

Over the years there have been occasional references in the dental and medical literature concerning the toxic hazards of amalgam. Few such references have appeared in recent years in American publications. It is generally felt among clinicians that no dangers are inherent in this material either to the patient or to the dentist.

A review of the subject in a current Swedish monograph warrants examination.[1] The mercury component in both silver and copper amalgam has been carefully evaluated for possible toxic and allergic effects and for the occupational hazards to dentists and their personnel.

Frykholm, the investigator, summarizes as follows:

"On the basis of these experiments the author discusses the qualities of mercury given off from amalgam and what amounts may be taken up by the body and concludes that amalgam treatment implies a certain exposure to mercury and that this exposure is mainly caused by the evolution of mercury during the insertion of fillings. Swallowing of fresh amalgam may play a part while the continuous abrasion seems to add very little to the total exposure. Copper amalgam, being less stable, may give rise to a somewhat greater exposure than does silver amalgam. According to our present knowledge in the fields of occupational hygiene and medicine the estimated exposure is not sufficient, however, to cause mercury poisoning in a conventional sense.

"While thus the possibility of systemic mercury poisoning occurring as a consequence of amalgam treatment must be definitely ruled out, the degree of exposure may well suffice to bring about allergic manifestations in patients highly oversensitive to mercury. . . .

"Considering that oversensitivity, even if of the contact allergy type, sometimes gives rise to general symptoms, the author presumes that dental treatment may cause allergic manifestations that need not necessarily appear as local reactions only. In the author's opinion this may explain the illnesses associated with amalgam treatment reported in the earlier literature. Even if the exposure then must have been higher than nowadays, due to inferior material and sometimes to inadequate methods of trituration and condensation, the mercury evolution cannot very well have been high enough to cause intoxication, but, more often than now, it must have been sufficient to give rise to allergic troubles that might have been misinterpreted and labelled as mercury poisoning. In this connection it is pointed out that the quality of the amalgam is of great importance. Copper amalgam, which according to metallurgic and clinical experience is less stable than silver amalgam, may in the long run give off amounts of mercury that are sufficient to sensitize the patient, whereas silver amalgam most probably does not.

"The health hazards of dental amalgam from an *occupational point of view* are discussed on the basis of some experiments comprising air analyses in dental surgeries and urinalyses of the dental staff. Comparative analyses of the respired air during the actual treatment showed that the nurse is exposed to considerably higher concentrations of mercury vapor than is the dentist or the patient, and that especially during certain phases of the work. In this connection the author emphasizes the desirability of certain technico-hygiene precautionary measures, the effect of which is demonstrated by a series of air analyses performed at a dental school during the years 1946-1957.

"Analyses of the urine of dentists, dental nurses and dental technicians complete the picture of the mercury exposure of the dental staff. The author's conclusions are that a strict mercury hygiene in a dental surgery is indicated not mainly by the comparatively slight risk of intoxication but rather by the risk of sensitization, especially as the invaliding consequences of mercury allergy may not become manifest until after long training and work in the dental profession. The author also points out that the use of copper amalgam necessitates a stricter hygiene in the surgery than does silver amalgam."

This monograph from the Royal School of Dentistry, Stockholm, is an excellent example of scientific dental research.

[1]Frykholm, Karl O.: Mercury from Dental Amalgam, its Toxic and Allergic Effects, and some Comments on Occupational Hygiene, Acta Odontologica Scandinavica **15**:91-92 (Stockholm) 1957.

MEDICINE and the Biologic Sciences

Atherosclerosis—Prevention

Myocardial infarction may result from sclerotic narrowing of a vessel, ulceration of an atheromatous plaque, or ulceration with thrombosis. The principal effect of food restriction and endocrine therapy in prevention of infarction is directed toward inhibition of atherosclerosis in the coronary arteries.

Atherosclerosis is a distinct entity dependent upon alterations in the metabolism of cholesterol, lipids, and lipoproteins. Many biologic, economic, and sociologic elements also influence the development of atherosclerosis. These effects, however, appear to be mediated through the cholesterol-lipid lipoprotein mechanism.

Some of the effects of diet on atherosclerosis have been clarified by studies of various population groups. No race that has a diet high in cholesterol and fat is free from the disease. The principal foods concerned are eggs, butter, and milk. The incidence of atherosclerosis is low in races that consume food rich in protein and low in neutral fat. In these population groups serum cholesterol levels are low.

The tendency toward atherosclerosis in persons eating large amounts of fat is curbed if dietary habits are altered. This occurred in Europe during World War II. Despite wide individual variations within population groups, ingestion of a high-fat, high-cholesterol diet is a prerequisite to the development of atherosclerosis. Individual factors determine the progress and extent of the disease once the cholesterol trigger mechanism is established.

In experimental animals, a high-fat, high-cholesterol diet is the only successful means of producing atherosclerosis. If the diet is adequate, lipotropic factors such as choline, inositol, lipocaic, and vitamin B_{12} exert no inhibiting effects upon the atherosclerosis process. No basis exists, therefore, for the use of lipotropic agents in the prevention of human atherosclerosis.

The effect of estrogens is suggested by the relative freedom of premenopausal women from coronary atherosclerosis. Estrogens administered to male animals produce feminization and increase the free cholesterol-total cholesterol ratio. Plasma phospholipids are increased and alpa and beta lipoproteins are reduced. Coronary sclerosis is prevented, but in the aorta the sclerotic process apparently is not inhibited.

Katz, Louis N.: The Role of Diet and Hormones in the Prevention of Myocardial Infarction. Ann. Intern. M. **43**:930-941 (*November*) 1955.

Ego Disintegration In the Aged

Depressive reactions are among the most frequent psychiatric disorders seen in the elderly. The factors producing these depressions seem an outgrowth of the person's perception of changes in his social and physical status. These changes threaten his self-regard.

The second major psychiatric disorder in the elderly is senile dementia. This is an example of ego breakdown in which organic changes in the central nervous system may be important. There is no consistent relationship, however, between the clinical picture and the postmortem findings.

Some of the disorders affecting hospitalized elderly people fall into the category of schizophrenic reactions rather than into the senile dementia group. Schizophrenic reactions in the elderly have generally been ignored.

In addition to these more clearly defined types of breakdown, there occur varying degrees of disturbed behaviors which are often grouped under the heading "adjustive reactions of later life." The elderly person may become argumentative, hostile, withdrawn and suspicious. Adjustment problems of this sort represent clinical examples of partial breakdown in ego functioning.

The adjustment of elderly people demonstrates the importance of the subject's mechanisms for dealing with feelings about himself and about others. Adjustment techniques become progressively more ineffectual and the elderly person is largely defenseless against the major stresses of old age. He may then rely on memories and fantasies for his gratification and live in the past. The person with such defects is most vulnerable to the loss of external supports that come with age—loss of friends, relatives, and jobs.

Bodily changes associated with aging, such as physical beauty and attractiveness and motor efficiency are other stress factors for the elderly. Neurophysiologic impairment of the brain may result from a cerebrovascular thrombosis or hemorrhage or from the more subtle cause of failing circulation. Unfortunately, physical damage to the brain is seldom easily reversible.

The ego is unable to evaluate either the "me" or the outside world. Autistic logic and denial, strongly clouded by unconscious factors, replace reality testing and the person is left largely defenseless. The fears of terminal pain, disfigurement, and dying

alone or unattended are more pressing than death itself.

Busse, E. W.; Barnes, R. H.; and Cohen, L. D.: Factors Producing Ego Disintegration in the Aged, North Carolina M. J. **16**:528-532 (*November*) 1955.

Predicting Physical Dimensions

From infancy to maturity, growth and development are fairly regular. Any physical measurement tends to follow a constant percentile channel if a child remains in the same socioeconomic class and does not acquire a chronic disease.

Available data confirm that the average boy at 2 years of age is roughly one-half as tall as he will be at maturity. For girls, the height at 18 years is roughly twice the height at 18 months.

Dividing the percentile measurements for weight at 2 years into the corresponding figures at 18 years reveals a regular ratio of 1 to 5 in boys. In girls the ratio remains the same, again, if the weight at 18 months, rather than at 2 years, is used in calculation.

Pelvic breadth measurements do not show a sex difference. For both boys and girls, the pelvic breadth at 18 years is twice the pelvic breadth at 2 years.

These mathematical relationships may be formulated as follows:

Height: Boys—2 times the height at 2 years equals the height at 18 years. Girls—2 times the height at 18 months equals the height at 18 years.

Weight: Boys—5 times the weight at two years equals weight at 18 years. Girls—5 times the weight at 18 months equals the weight at 18 years.

Pelvic breadth: Boys and girls—2 times the pelvic breadth at 2 years equals the pelvic breadth at 18 years.

Between World War I and World War II, a period of about twenty-five years, a considerable increase took place in the height and weight of adolescents and young adults in countries with improved diets and modern medical science. Since World War II, however, a comparable increase in size in the same groups of population has apparently not taken place. The above relationships should, therefore, remain valid for the next generation at least. However, a major catastrophe such as World War III, might invalidate the relationships.

Kowaloff, Irwing: Prediction of the Height and Weight and Pelvic Breadth of Children at Age Eighteen, New York, J. Med. **55**:3464-3466 (*November*) 1955.

Diabetes—Myocardial Infarction

Diabetes may accelerate atherosclerotic changes. Coronary artery disease occurs among 40 per cent of patients with diabetes. It is the most common cause of death, accounting for almost half of the fatalities in these patients.

Myocardial infarction affects nearly 1.5 to 4 per cent of patients with diabetes. The prognosis is poor. Approximately 60 per cent of the patients die within two months, whereas the mortality rate for nondiabetics is probably 15 to 25 per cent.

In the general population the incidence of coronary occlusion is two to four times greater among men than among women. In diabetes the frequency is about equal. The likelihood of a woman's having coronary occlusion is increased 14 times by diabetes.

Diabetes alone seems to be an important cause of death, since over half of women with diabetes who die shortly after myocardial infarction do not have angina, hypertension, a previous infarction, heart failure, or obesity. The death rate after myocardial infarction among diabetic males without complications is only about 8 per cent.

Duration of diabetes may be important. Infarct is probably more likely to be fatal if disease is longstanding. Prognosis is poor if a patient with diabetes has angina pectoris. After the onset of angina, the average life expectancy is only one and a half years. Over half of the patients die within one year.

Hypoglycemia alone is not a significant factor in producing myocardial infarction. Insulin improves the myocardial utilization of carbohydrate even at blood levels of 60 milligrams per centimeter. Epinephrine liberation in response to low blood sugar, however, may increase cardiac work and precipitate symptoms. Insulin requirements usually increase or remain unchanged. The diabetes frequently behaves in the same manner as with infection.

Good control of diabetes does not reverse coronary changes and may not delay development or reduce incidence of coronary artery disease. Aggressive therapy, however, reduces frequency of retinal, renal, and peripheral lesions and offsets adverse effects of diabetes.

When diabetes is uncontrolled and acidosis with or without ketosis occurs before or after myocardial infarction, the outcome is fatal. Severe peripheral vascular collapse usually precedes death. Shock and liver cell necrosis have not positively been related to carbohydrate metabolism.

Bradley, R. F., and Bryfogle, J. W.: Survival of Diabetic Patients after Myocardial Infarction, Am. J. Med. **20**:207-216 (*March*) 1956.

Physical Medicine

Physical medicine may be defined as the use of physical forms of energy for therapeutic and diagnostic purposes in medicine. The various forms of diathermy in use today have established an item of importance in physical medicine.

Diathermy includes chemical techniques employed to achieve "deep heating", for example, heat development in the tissue beneath the skin and subcutaneous fatty layers by means of conversion of various forms of physical energy into heat. Sufficient deep heating will cause temperature rise, consequent vasodilation, and increase in cellular permeability and metabolic rate in the exposed part of the body.

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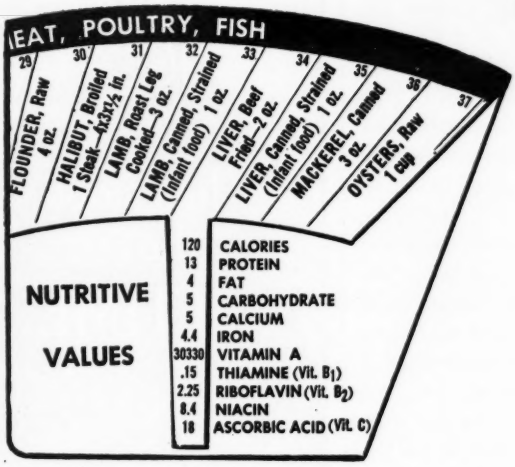
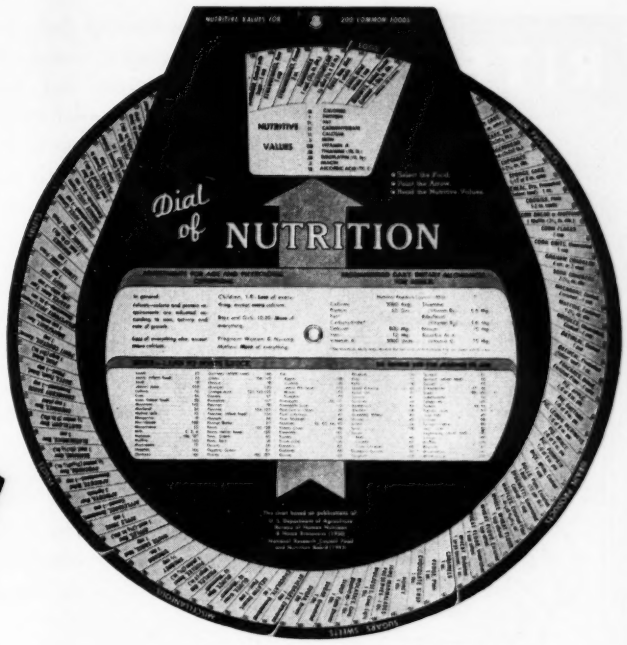


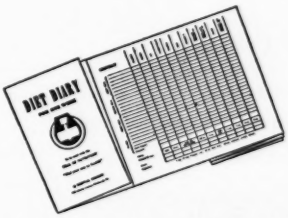


With diet the popular subject of newspaper columns, magazine articles, lectures, and books, the average layman is rapidly becoming nutrition-conscious. Unfortunately, he is also becoming nutrition-*confused*.

You can help the patient who is groping for food-facts (as well as the one whose dental or general health indicates a definite dietary deficiency) by recommending the simple and accurate DIAL-DIARY method of checking food intake in terms of nutritional needs.

The DIAL OF NUTRITION is an 11″ movable disk, printed on both sides and mounted between two indicator panels so that 10 important nutritional components (and the caloric values) of 200 common American foods may be easily read. We have reproduced above, in full size, one of the two indicators you will find on each chart. You have only to select the food, point the arrow, and read the nutritive values which appear in the indicator slot.

The DIET DIARY is a convenient folder in which each item of food eaten at, or between, meals is recorded for the period of one week. The nutritional components of each food are determined by consulting the DIAL, and then entered in the proper spaces on the DIARY page. At the end of the day, or the end of the week, totals are checked against recommended dietary allowances. (All figures on the DIARY and the DIAL are those determined by the U. S. Department of Agriculture and the National Research Council.)



Gaining proper nutritional balance by correcting obvious nutritional deficiencies is then merely a matter of intelligent selection of food—and, again, the DIAL OF NUTRITION is a dependable and convenient guide. Three DIET DIARIES are sent with each DIAL OF NUTRITION.

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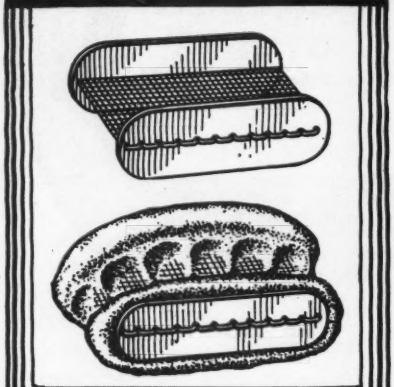

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Diathermy is indicated in cases where local increases in blood circulation and metabolic rate are considered beneficial. Ideal deep heating cannot be achieved effectively by "surface heating" as performed by application of local heat with warm water, heating pads or infrared rays. The reason is that thermal flow from the heated body surface often has to overcome a more or less prominent subcutaneous fatty layer. This layer possesses a comparatively poor heat conductivity and, therefore, necessitates substantial and often intolerable temperature rise in the surface of the skin in order to achieve sufficient heat transfer into the interior. Ideal heating, therefore, must rely on its ability to transform certain forms of physical energy, which in themselves are not dangerous to the body tissue, into heat beneath the subcutaneous fatty material, with only minor heat loss in the skin and fatty matter.

It is characteristic of the various forms of diathermy presently available that each of them, shortly after its acceptance by the medical profession, was overestimated in its performance. This happened with so-called ultra-shortwave diathermy, which is essentially the application of ultra-high-frequency currents for heating purposes. It happened to some extent with so-called microwave therapy, which is the application of electromagnetic radiation for heat production. Also, it occurs now with "ultrasonic therapy," that is, the application of high frequency mechanical vibrations.

Both ultrasonic therapy and microwave therapy have greater depth effect than so-called ultra-short wave diathermy. However, while the frequency for available ultrasonic equipment is well chosen, this cannot be stated for currently available microwave equipment. The use of ultrasonic equipment is favored because of depth of penetration in the deep tissues of the muscular type beneath subcutaneous fat, energy loss in the subcutaneous fat, and the possibility of administering with the so-called stationary treatment technique well-defined dosage. Microwave equipment, at this time, is only capable of delivering heat into tissues with high water content beneath the subcutaneous fat layer when this layer is rather thin. Its depth of penetration in tissues of high water content is small, and the possibility of establishing from metered output the biologically effective depth dosage is seriously limited.

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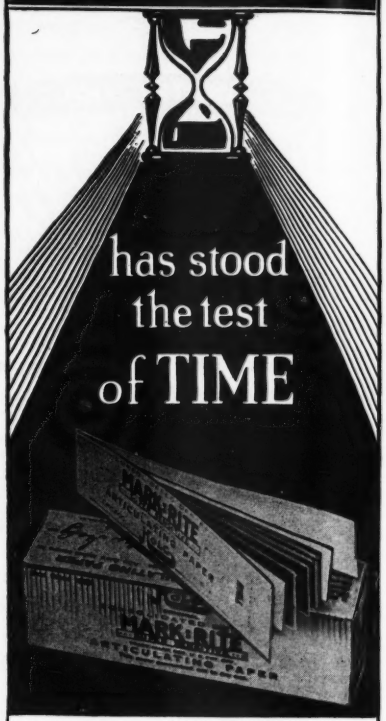

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INTERSTATE DENTAL CO., INC.
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Schwan, Herman P.: The Biophysical Basis of Physical Medicine, JAMA **160**:191-197 (*January* 21) 1956.

BUY SECURITY BONDS

Contra-Angles

Quandaries, Unlimited

With all the publicity over the relationship between smoking and lung cancer some dentists are probing their souls and trying to come up with the big decision: Should I quit smoking?

The two physicians who made the announcement before the American Medical Association on the dangers of cigarette smoking were pictured in the newspapers as being pipe smokers. This could have been one of those contrived publicity gimmicks. In any case the cigar or pipe smoker seems to be in less danger.

A British physician who made the big decision wrote to *Lancet* in this vein:

"I have stopped smoking cigarettes. How smug I am. Nobody dislikes me more than me too. There are no compensations. My singing voice has improved, but then I could not sing a note in key before, so that the only effect of this is that my bathroom voice penetrates more piercingly into the privacy of my musically minded family.

"My breathing is also freer. Great lumps of lovely fresh air sweep down into the alveoli that have been smoke-filled for years. So, also, do large dollops of the Metropolitan atmospheric cocktail of diesel oil and smog.

"My squash-rackets has improved of course, but I am too old to be still playing the game and the extra effort that I can now put into it must be taxing my coronaries to the limit, and no doubt very shortly to beyond the limit, of their endurance.

"Appreciation of good food and wine is a long-forgotten and now renewed delight; particularly to my tailor who has done all that safety and decency permits in the way of letting out, and now with undisguised

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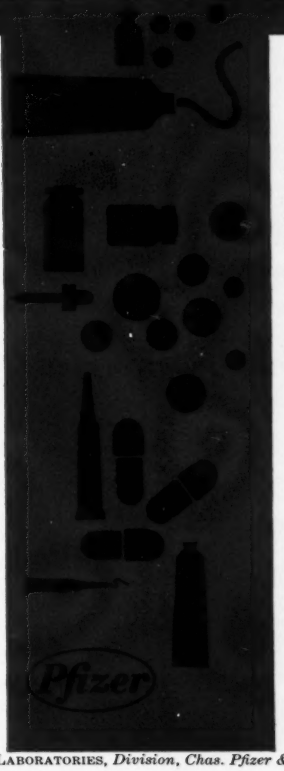

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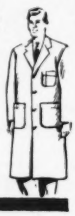

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If cigarettes do not get you, radiation fallout probably will. When the first nuclear devices were detonated we were assured that there was no danger to human life unless a person was in the target area. All this positive talk was made although there was no shred of experience to back it up. Now we find that a couple thousand reputable scientists have climbed off the bandwagon and are telling us that radiation fallout is a real threat to life and health.

The situation has become so confused that *Medical Science* has said:

"What is known about radiation? There seems to be general agreement on these points: man is exposed to radiation from natural sources (cosmic rays), therapeutic uses, and atomic fallout. But the big question, still unanswered, is: at what point does the amount of radiation become too great not to affect man's progeny?

"In view of the welter of conflicting opinions, perhaps the advice offered by a London doctor is as good as any: (1) stop seeing the doctor, and thus avoid x-rays; (2) drink no milk and thus avoid the intake of cesium-137; (3) never go outside and thus avoid exposure to cosmic rays."

Unfortunately, people have read many scare stories and are offering resistance to the suggestion to have dental x-ray examinations. There is not one fragment of evidence that the x-ray as used properly in dental practice has ever harmed anyone.

Life, the magazine that knows everything, recently included a scare piece on the dangers from fallout from Strontium-90. An ominous mushroom cloud from a nuclear blast

(ADVT.)

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was pictured, then the fallout was shown descending upon the land where cattle grazed while being poisoned in their pasture. In time an innocent child drank the cow's milk that was laden with Strontium-90. The child was doomed to leukemia and bone cancer. So pontificated *Life*, the all knowing.

At the moment *nobody knows* that this picture is true and until we do a disservice is done to mothers who will have guilt feelings while they fill their children with the one quart per day ration of milk. In my judgment, milk is by no means the "perfect food" for anything except a calf. It is a good supplement to other foods. There is some doubt that it is a fluid that should be used in any considerable quantities by adults, certainly not to the measure of a quart a day.

Despite these adverse aspects to milk it is unscientific and unjust to scare mothers from this food supplement by waving the threat of leukemia and cancer of the bone to their children.

There is no way that we can "return to nature." We are irrevocably committed to the "life of progress" which is ironic in many facets. Armies can no longer fight with broadsides or muskets: with men in individual combat. Science has given the weapons of annihilation. A family no longer raises its own foods. Science has given us poison sprays for our crops and antibiotics for our animal food sources. People have lost the skill to entertain themselves by conversation or playing games in the home. Science has given us television.

Stopping the cigarette habit may reduce the incidence of lung cancer. Curtailing nuclear tests may be favorable to the health of the nation. There are still other conditions of disease and degeneration that we have not touched. We will have to take a closer look at other things in our environmental field that may be factors in disease.

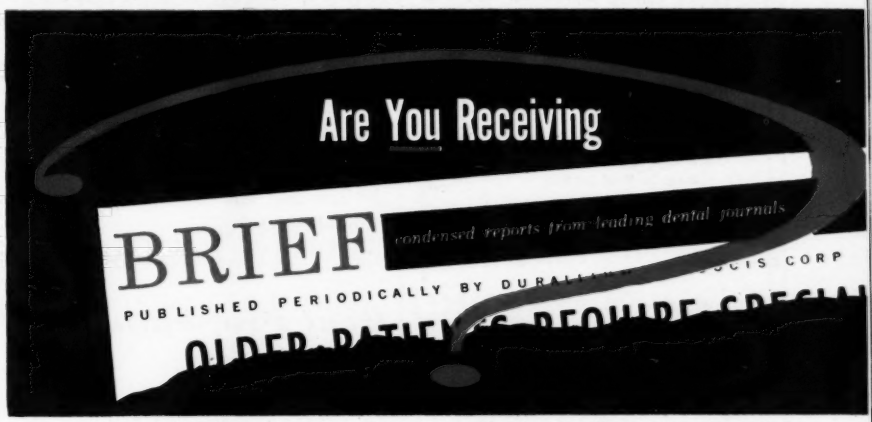
An example of this confusion is demonstrated by an exchange of remarks before a subcommittee in the U. S. Senate:

"Senator Bricker (R., O.) precipitated the mass confession of lack of knowledge on the problem of radioactive fallout when he addressed the group as follows:

" 'I have been trying for two weeks to get an answer on whether radiation produces leukemia and bone cancer. I haven't an answer yet although I have listened to statistics purporting to show that thousands of persons in future generations will die of leukemia and bone cancer because of the present radioactive fallout. How in the name of common sense can you make such predictions if you don't know that radiation actually produces those diseases?'

"The scientists, huddled around a table in front of the subcommittee, looked at each other. None could answer Bricker's question. Finally came the admission that the statistics given the subcommittee had been based on the 'assumption' that radiation did cause leukemia and bone cancer and that 'conclusions' had been drawn from that hypothesis.

" 'People are getting scared,' Bricker pursued. 'Hasn't this radioactivity problem been overemphasized? What



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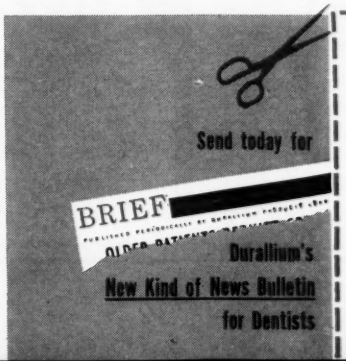

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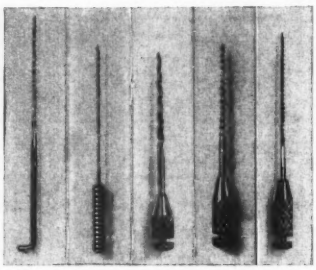

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about the health hazards from pollution of the air, water and food by other substances? Aren't they far greater?

" 'I agree heartily,' responded Doctor Wright Langham of the Los Alamos scientific laboratory, atomic energy commission. 'There is no doubt that radiation has been the most emphasized hazard in history. Technologic development has now made man the weakest link in his own future. We should emphasize more the human aspects in all factors of technological advancement.' "

It is slightly encouraging that some mention is being made of *humanitarian* ethics. If we do not place more force on humanitarianism, one day we may awaken to find that as a nation we have outsmarted ourselves and have by our own hands built the devices for our own destruction—technological suicide.

—E. J. R.

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5. Fingers serve to grasp and act as a pivot rest. The wrist rotates and moves the entire hand.

6. Establish a full efficient contact of the instrument with the tooth.

7. Fully scale deep pockets to ascertain depth and outline.

8. Scale each surface until no resistance is registered by soft or hard pocket contents around the entire sulcus or into pocket.

9. A good blood clot should remain in the deeper sulcus. (Healing cannot take place in deeper sulci if the clot is washed out.)

From *Journal of the Wisconsin Dental Society* **33**:109 (May) 1957.

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(See pages 366 and 367)

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fascia to prevent bridging by new bone and reankylosis. A satisfactory prosthetic replacement to reconstitute an artificial joint has not yet been developed, but in cases in which considerable bone must be removed from the rami and the gap thus created is wide, either an acrylic block or a block of autogenous costal cartilage has been interposed to prevent posterior subluxation and malocclusion. Long term follow-up reports on these cases are not yet available.

Adapted from *New England Journal of Medicine* **256**:993 (May 23) 1957.

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